SEPTEMBER 24, 1951

STEEL

THE WEEKLY MAGAZINE OF METALWORKING

NEW ONE-COAT ENAMEL
—Premium Product on Non-Premium Steel, p. 67

ABRASIVE METALS INDUSTRY
—Big Impact from Little Pellets, p. 68

WING SECTIONS FROM SOLID METAL
—Using Template-Guided Tools, p. 98

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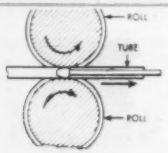
Standardization
-KEY TO MORE FOR LESS

—see page 94

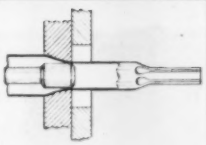
let's take a CLOSER LOOK at Surface Finishes

If you machine or fabricate hollow parts from tubing, chances are you have one or more *finishing* problems. Perhaps you can *start* finishing right in your own purchasing department by specifying the type of mill-finish best . . . and most economically . . . suited to your end-use requirements.

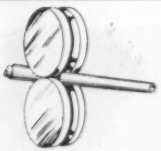
As a specialty tube mill, B&W can supply mechanical tubing with any of the following finishes — as an integral part of the manufacturing process:



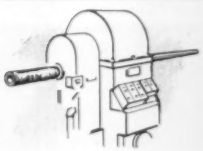
HOT-FINISHED
bears the scale formed during hot fabrication or heat treatment.



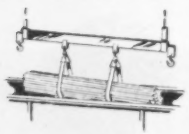
COLD-DRAWN
smooth, scale-free surface.



ROCKED
smooth surfaces, obtained by special sizing and finishing process.

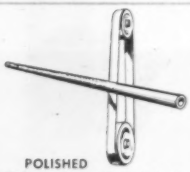


TURNED
machined, uniform O.D.



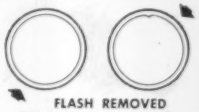
PICKLED
de-scaled by one of several solutions.

SHOT- OR SAND-BLASTED
O.D. and/or I.D. scale is removed by blasting.



POLISHED
O.D. and/or I.D. polished to one of several specified degrees of smoothness.

FLASH-IN
ERW tubing which retains the bead formed by welding.



FLASH REMOVED
ERW tubing, bead - free.
Both available either as welded or normalized.

Remember—tubing is not just bar-stock with a hole in it, but a semi-finished product, having a wide range of optional finishes, tolerances, chemical and mechanical properties. Ask Mr. Tubes — your B&W Tube Company representative — to help you select the tubing best suited to your particular applications.

B&W SEAMLESS and WELDED TUBES

THE BABCOCK & WILCOX TUBE COMPANY

***Executive Offices:* Beaver Falls, Pa.**

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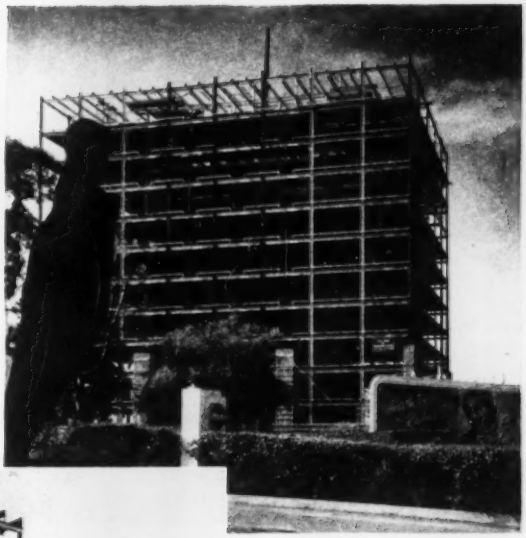
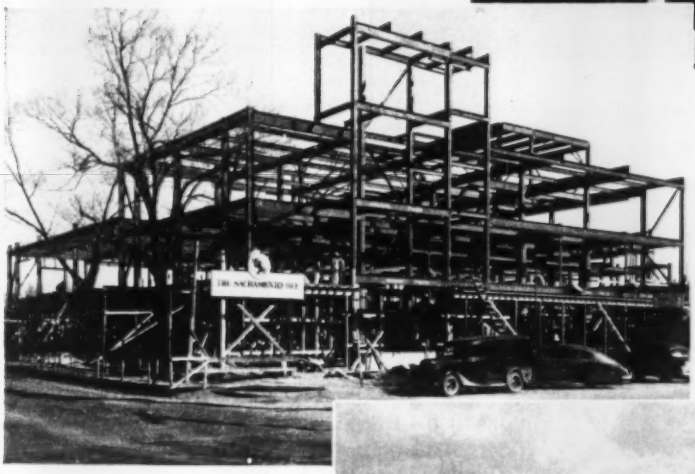
TA-1639M

NEW Steel Construction by BETHLEHEM PACIFIC





AT LOS ANGELES—Framework for the first of three units of the new Tishman office building on Wilshire Boulevard. Each of these 12-story, limit-height structures will provide 200,000 sq ft of air-conditioned office space. Bethlehem Pacific is fabricating and erecting the 3600 tons of structural steel for the project. The general contractor is C. L. Peck. The architect is Claud Beelman. The engineers are Brandow and Johnson.

AT SACRAMENTO — Framework for the new press building of The Sacramento Bee. This is one of two adjoining structures to be erected for the McClatchy Newspapers. Designed to provide space for the press room, composing room, stereotype foundry and editorial offices, this building contains approximately 350 tons of structural steel.

Bethlehem Pacific is handling the steel fabrication and erection of both buildings. The general contractor is Lawrence Construction Co. Architects and engineers are Lockwood-Greene, Inc.

AT SAN DIEGO—The new Midway Drive Bridge across the San Diego River flood control channel. This 11-span, 1291-ft structure required 1700 tons of steel. Except for the vertical stiffeners, the girders are made of Mayari R low-alloy, high-strength steel. Bethlehem Pacific is handling the fabrication and erection. Guy F. Atkinson Co. is the contractor on the substructure; the Vinson Construction Co. of Phoenix is the contractor for the roadway decking. Consulting Engineers are Sverdrup and Parcel, Inc.

BETHLEHEM PACIFIC COAST STEEL CORPORATION

Fabricating Works: Los Angeles, Alameda, South San Francisco, Seattle

BETHLEHEM PACIFIC

BETHLEHEM STEEL

Photo Courtesy The Messinger Mfg. Co., Tatamy, Pa.

FACTS on improving production!

The Messinger Mfg. Co., famous for over 90 years as manufacturers of agricultural implements and woodworking machinery, replaced six machines with three modern Jones & Lamson Turret Lathes.

Now, large and small lots of sheaves, bearing caps, blowers, blower cases, worm gear housings, etc., are turned with peak efficiency and economy. ONE YEAR'S SAVINGS, BASED ON DIRECT COSTS ALONE, MORE THAN PAID FOR THE THREE NEW MACHINES AND EQUIPMENT.

3 Jones & Lamson Turret Lathes do the work of 6 other machines better, faster, cheaper!

Jones & Lamson Turret Lathes are Built and Powered to produce — MORE CHIPS PER TOOL — MORE PIECES PER HOUR — MORE PROFIT PER JOB — *than any other turret lathe of comparable size.*

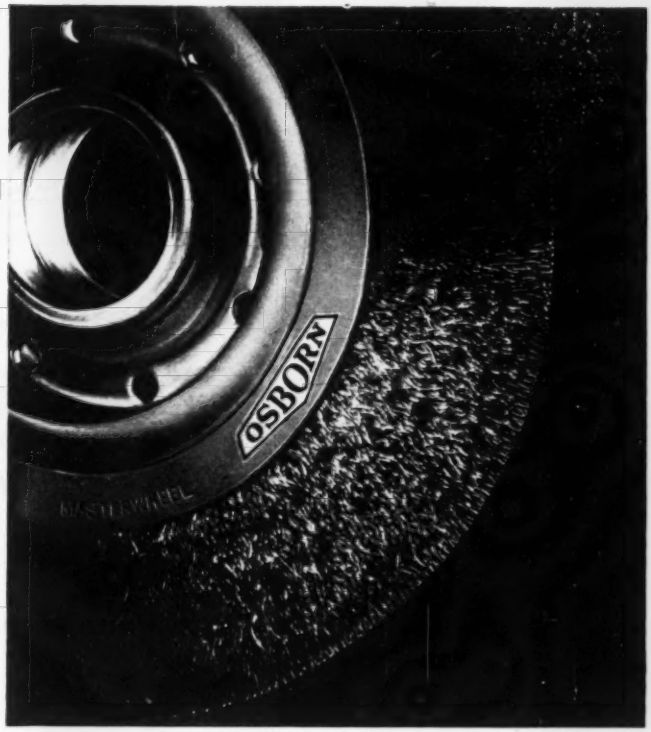
Now, more than ever, the most efficient machines and methods are needed to make the most of your available manpower and material. Jones & Lamson is ready, willing and able to help you get maximum results from your turning, threading and inspection operations. Write *today* to Department 710.

Turret Lathes — Fay Automatic Lathes — Thread Grinders — Optical Comparators — Threading Dies

JONES & LAMSON

MACHINE COMPANY
Springfield, Vermont, U.S.A.

Machine Tool Craftsmen Since 1835



Multiply your manpower with these new steel muscles

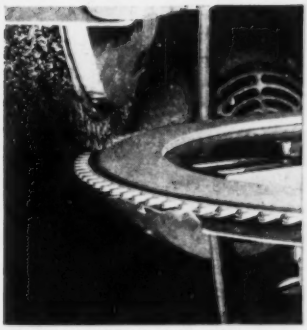
Thousands of plants are discovering how to lick manpower problems with new Osborn Brushing techniques. Let's find out how they can help *you!*

Machine-powered Osborn brushes are removing burrs from threads and other parts 3 to 10 times faster than former hand methods. They are doing product cleaning, finishing and many other operations in a matter of seconds. They release skilled manpower for other work and cut rejects to the minimum.

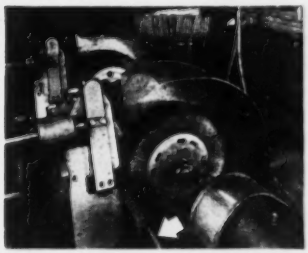
Whether your product is metal, rubber, plastic or fabric, it will pay you to call in the **O**sborn **B**rushing **A**nalyst to study your cleaning, deburring and finishing operations. He will recommend improvements with the latest Osborn power brushing techniques. Call or write *The Osborn Manufacturing Co., Dept. 526, 5401 Hamilton Ave., Cleveland 14, O.*

OSBORN

LOOK FOR THE NAME OSBORN . . . RECOGNIZED EVERYWHERE FOR QUALITY WORKMANSHIP AND MATERIALS



DEBURRING OUTPUT TRIPLED. That's the production increase in this plant using Osborn Power Brushing for the removal of burrs from clutch discs. And quality of finish is greatly improved.

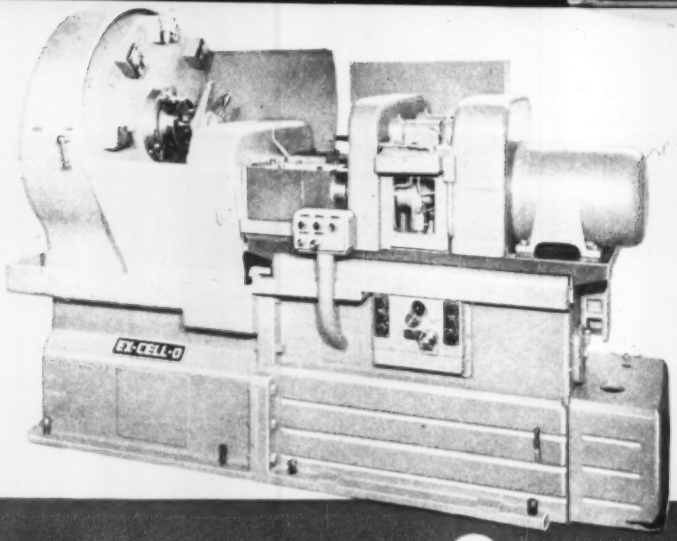


FINISHING OUTPUT UP 20%. Osborn Power Brushing removes heat-treat discolorations and surface imperfections of these shafts prior to plating. Cut number of passes from two to one, increasing output 20%.

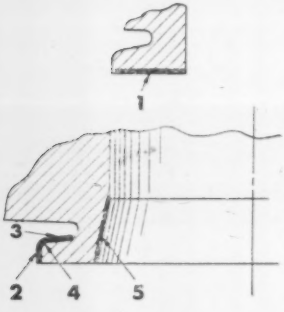
THIS IS "OSBORN". Our engineers . . . in the field and at the factory . . . have a vast fund of experience to help solve your cleaning and finishing problems. When you buy brushes with the name "OSBORN" you can be sure you are getting tools for unsurpassed production *results!*

See New Osborn Brushes and Methods at National Metal Exposition. Detroit—Oct. 15-19—Booth D 118

Ex-Cell-O One-Way Precision Boring Machine.



5 OPERATIONS ON 8 HOLES IN LARGE JET PART



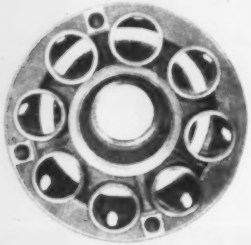
A TYPICAL EX-CELL-O SOLUTION TO A DIFFICULT PRODUCTION PROBLEM

THE JOB: a large jet engine part requiring complex precision machining.

THE MACHINE: Ex-Cell-O One-Way Precision Boring Machine equipped with two heavy duty spindles and a manually indexed fixture.

THE RESULT: five precision operations on eight large holes (a total of 40 operations). Net production—about three pieces per hour.

Operations performed are shown at left in heavy lines. The front spindle carries a facing head which feeds radially to face the front of the flange (1). The boring head of the rear spindle carries four tools, three of which are on slides. These successively (2) turn the O.D. of the flange, (3) back-face the flange, (5) taper-bore the I.D., and (4) plunge the radius at completion of the back-facing cut. For further information contact your local Ex-Cell-O representative or write direct.



Five operations are performed on each of eight large burner holes in this jet engine part.

EX-CELL-O CORPORATION DETROIT 32, MICHIGAN

MANUFACTURERS OF PRECISION MACHINE TOOLS • CUTTING TOOLS • RAILROAD PINS AND BUSHINGS • DRILL JIG BUSHINGS • AIRCRAFT AND MISCELLANEOUS PRODUCTION PARTS • DAIRY EQUIPMENT

(1-4)

STEEL

The Weekly Magazine of Metalworking

VOL. 129 NO. 13 SEPTEMBER 24, 1951

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Next Week ... **Where the Steel Is Coming From: Statistics on the Industry's Capacities ... Marquenching Expands Use of Carbon Steels ... Experience Growing in Forming, Machining Titanium Alloys ... Careful Analysis Can Lower Your Cutoff Costs**

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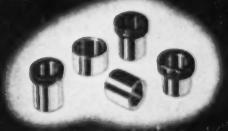
XLO

EX-CELL-O for PRECISION

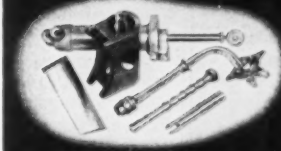
PRECISION MACHINE TOOLS

CONTINENTAL CUTTING TOOLS

PRECISION GRINDING SPINDLES



DRILL JIG BUSHINGS



AIRCRAFT AND PRECISION PARTS

HYDRAULIC POWER UNITS

Products of

EX-CELL-O CORPORATION

DETROIT 32, MICHIGAN

51-18

Tell Us Your Troubles

ONE OF OUR PRODUCTS— OR ONE OF OUR MEN— MAY SUPPLY

the Cure!

Sticking out our neck, asking for trouble, has shown us what the metal working industry needs, and led the way to bringing the various PELRON Chemicals for Industry up to their position of leadership.

Cutting oils, drawing, forging, grinding and cleaning compounds to meet the varying and imperative demands of today's production methods, are the result of tackling, and licking, problems that have plagued our customers.

What has solved others' problems could be the solution to yours— it's worth looking into, isn't it?

In foundries, machine shops, finishing departments — in short, throughout the metal-working industry, results are improved, time and materials are saved, machinery, equipment and tools are given increased life, by the use of various PELRON Chemicals for Industry.

Call or write our nearest sales office, for information or assistance, samples or demonstrations.

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Behind the Scenes...

Recreational Vocations

In a notice section of a Superintendent of Document's promotional piece our eye was caught by this sentence: "Occasionally we are asked why the Federal Government issues hobby books." We confess — after reading such titles as "Hamster Raising," "Useful and Ornamental Gourds," "Attracting Birds," "Growing Annual Flowers" and "Home Dyeing with Natural Dyes" right in the same leaflet—that we often wondered too. But the notice section continued: "Actually no hobby books are issued as such, but many publications printed as part of a regular program of a government agency are of interest to hobbyists and to others who may have a professional or avocational interest. For example, the publication on photography was prepared and issued to train naval personnel. 'Operation of Small Boats and Harbor Craft' was written as a training manual for the Army."

Sailors with cameras and soldiers in boats puzzled us; so we began to categorize just for ourselves the agencies that went with other titles. The one on hamsters (they're little rat-like rodents) we infer was not written for the Department of Agriculture perhaps it was for the Department of Internal Revenue to ferret out tax dodgers. The one on Gourds might not be for anything in the government but we have several nominees for the title of Gourd Head of the Year who might find the small volume useful.

Rude Awakening

A friend of ours has suffered an ego-deflating experience. It will probably sour him on ever buying another television set. For several months he has been eagerly awaiting the day his young son would widen his eyes in recognition and gurgle "Daddy." The other day he confessed that the boy was still stumbling over that dear-to-the-heart word, but had come forth with a clear enunciation of "Hopalong Cassidy."

Strange but Fitting

The American Standards Association put out a little booklet some time ago called "The Strange Case of the Seven-Sided Post Hole." It got a lot of attention from people in metalworking and from people right here in our shop.

When the editors were casting about for an idea to illustrate Ben Melnitsky's article (starting on page 94) on setting up a company standards organization they availed themselves of ASA's printed permission to reproduce any of the material if credit was given. Their hats (ours, too) are off to ASA and Tom Ross, the clever fellow who illustrated the booklet. One of his cartoons appears as the cover illustration this week; several others are used to illustrate the article. Incidentally, the odd-shaped white background for the cover cartoon is an oblique allusion to the seven-sided post hole.

Verbal Facility

We are intrigued by a letter to our editors appearing on page 12 of this week's issue. It comes from a reader in far-off Japan and gives a peek at wartime production efforts on the part of our ex-enemies. The editors reprinted the letter in its original form. We believe our correspondent handles our language better than we do his; our Japanese is atrocious.

Puzzle Corner

First honorary BTS degree, complete with sheepskin, goes to Frank A. Schneider Sr. of the F. A. Schneider Co., Bucyrus, O., for his high industrial IQ. His grade of 100 in the Sept. 3 quiz is tops. We hasten to give credit for the Sept. 3 puzzle to H. C. Osborne of Racine, Wis., who mourns: "Even if those of us who see the plant copy of STEEL the day after publication date put in our reply the same day, we still can't get credit for our answers." This is a particular problem, one entitled to further study. With increases in mail rates looming, far be it from us to recommend air mail replies. It'll be all we can do to keep a stock of inflated penny postcards.

Answer to the Sept. 10 problem supplied by Robert W. Huff of Canton, O., was shorter than ours. Incidentally, we kept a constant vigil over the mails, hoping to hear from Mr. Osborne, but nothing has arrived. In the hotel problem the men paid a net of $27. That amount included $2 held by the bellboy and $25 paid the hotel. The trick lies in asking the question in such a way that the questionee adds the $2 to $27 instead of subtracting it. This is the truth, and truth is sometimes tiresome, so we are continuing to search for the imaginary $1.

Shrdlu

(Metalworking Outlook—Page 57)

Wellman will build it

Special Cranes
Gas Producer Plants
Charging Machines
Industrial Furnaces
Car Dumpers
Gas Flue Systems
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Coke Pushers
Mine Hoists
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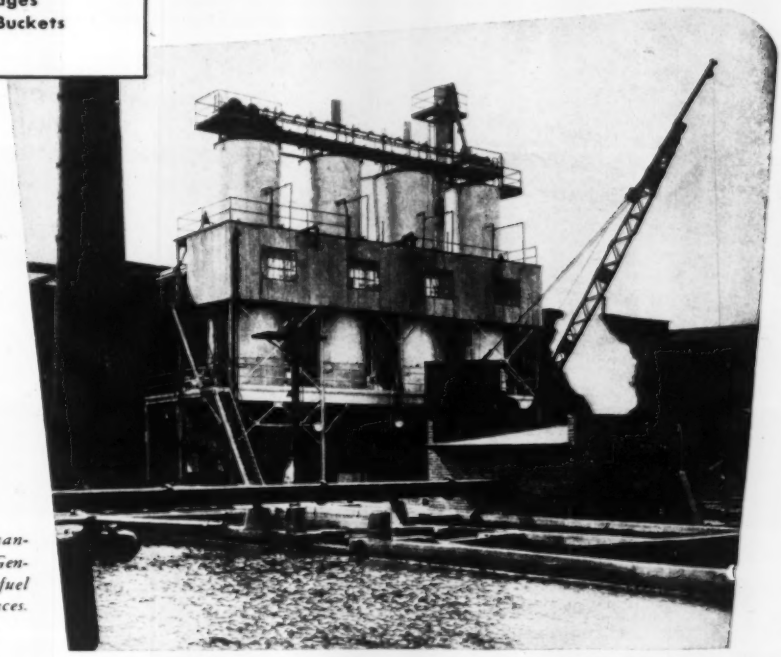
Wellman-Galusha Clean Gas Generators

Built exclusively by Wellman



Four 10 ft. Wellman-Galusha Clean Gas Generators supplying fuel for steel mill furnaces.

• Only Wellman builds the Galusha Clean Gas Generators that so ideally meet your requirements with efficiency and economy. These generators combine, in a *complete* machine, the rotary grates, ample fuel storage bin, and provisions for generating the steam required for making the gas. Even the lowest-priced grades of Anthracite and coke can be satisfactorily gasified.

THE WELLMAN ENGINEERING COMPANY

7029 CENTRAL AVENUE • CLEVELAND 4, OHIO

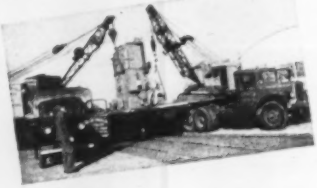
25% Step up Over previous methods

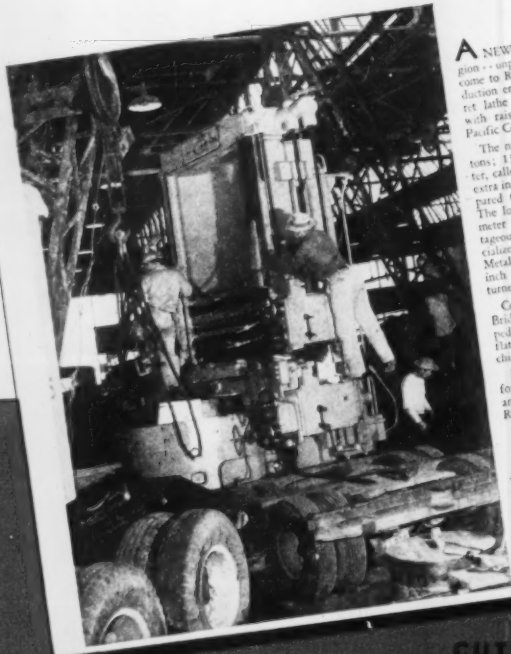
From Vol. 12, No. 2 "Ryan Reporter" published by Ryan Aeronautical Company, Lindbergh Field, San Diego 12, California.

BULLARD

CUT MASTER

The West's tallest lathe speeds work on jet engine parts for Ryan customers





A NEW and -- for this Western region -- unprecedented machine tool has come to Ryan. In the language of production engineers, it is the vertical turret lathe with the highest boring mill with raised bed ever installed on the Pacific Coast.

The new machine is an immense (32 tons; 13 feet high) Bullard Cut Master, called "Hi Boy" in deference to 24 extra inches of height for its bed as compared to the standard vertical Bullard. The loftier bed places the 64-inch diameter turning table in the most advantageous position for accomplishing specialized milling on unusually tall parts. Metal sections measuring from one half inch to just under 7 feet in height are turned with ease.

Constructed in Bullard's plant at Bridgeport, Conn., the Hi Boy was shipped by rail direct to Ryan on a low-bed flat car that was designed for heavy machine tool transport.

Billie B. Lair, service representative for the West Coast Bullard distributor, and Darwin Whetstine, foreman of Ryan's jet assembly department, estimate

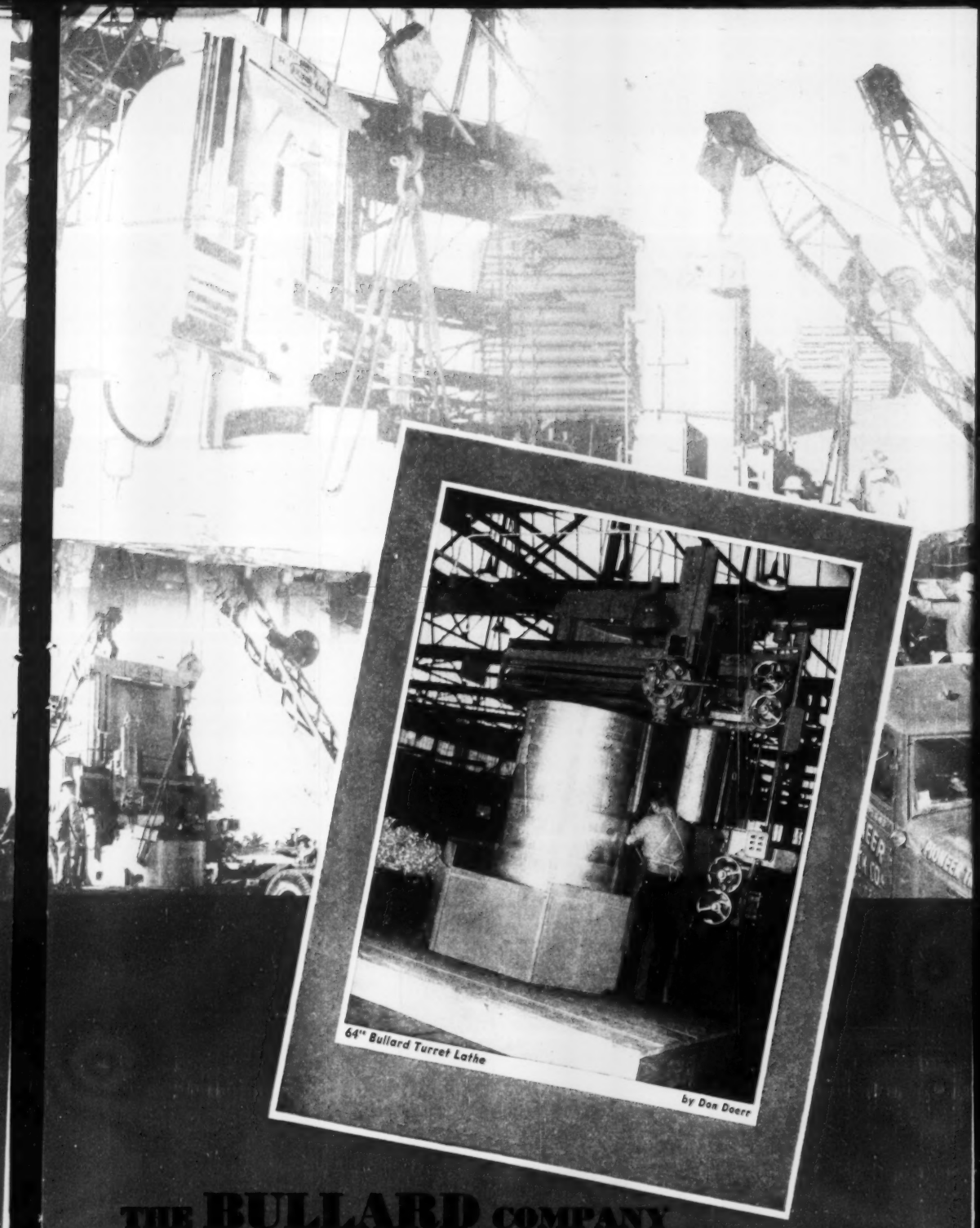
← Part of the main factory building wall was dismantled to permit moving the new Bullard "Hi Boy" into the machine shop.

→ Despite its extreme vertical dimension, an external fuel tank mid-section easily fits the 13-foot high lathe for "turning."

CUT MASTER *continued*

that, on the basis of first job runs, production on items like the 48-inch aluminum rings for external fuel tanks will be stepped up 25% over previous methods. Similar increased production rates are anticipated on steel cones, aft frames and other jet engine parts.

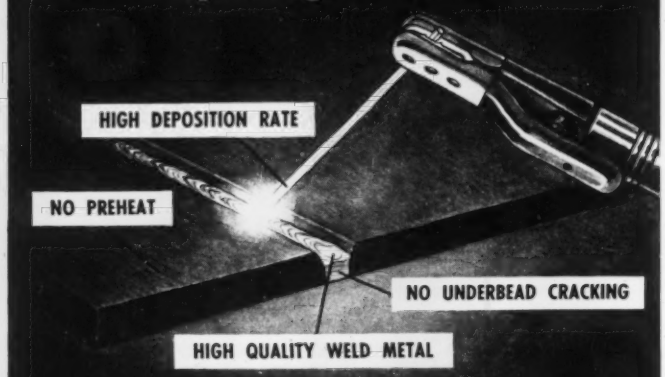
Emphasizing that a vertical turret lathe is really a conventional turning lathe raised to an upright position, Whetstine adds that he had only to set up a brief training program for his key men to insure skilled operation of the new equipment. Lair also points out that although the Hi Boy is a mighty husky number, its utilization is fatigueless for the operator. One man can run it safely and efficiently, manipulating the lathe's "pendant" (gear control arm) to set off electrical solenoids which in turn hydraulically actuate gear changes to produce desired rotating speeds up to 160 RPM on the fast-whirling table or chuck.



THE BULLARD COMPANY

BRIDGEPORT 2, CONNECTICUT

ARCOS
Low Hydrogen Electrodes



Speed Production— Save Critical Materials

Producing quality welds on high tensile fabrication jobs is essential today. Rewelds cost time and money. That's why it will pay you to depend on ARCOS — leader in the low hydrogen electrode field.

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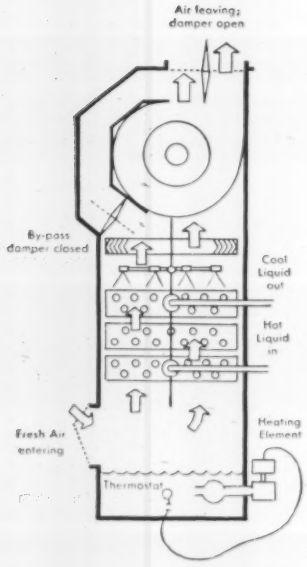

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3. "Balanced Wet Bulb" Control holds quench bath at proper temperature, heating if needed to start after shut-down, and cools or heats by automatic control.
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LETTERS TO THE EDITORS

Convention Dividends

My congratulations on the article, "So You're Going To a Convention," (STEEL, Sept. 3, p. 69). Businessmen who read and follow your advice will profit greatly.

Henry P. Fowler, manager
Trade Association Dept.
U. S. Chamber of Commerce
Washington

Japs Use Trepanning Too

Regarding the article, "Trepanning Lathe," (STEEL, Mar. 12, p. 87) as performed by Heppenstall Co., I saved time during the war in carrying trepanning cutting with 25 mm diameter x 1200 mm for tungsten and chromium-molybdenum steel. At the first time in the period I carried 8-11 atom pressure oiling in use of tools of high cobalt-high speed steel and sintered carbide and got the cutting rate of 8-10 meter per hour in maximum.

It is remarkable that the cutting rate is 480 inches per hour in the article. Hereon, I ask your favor to give me the detailed information about it, especially about types of cutting tool and holder, if it is allowable. Also it sure to be considered that Heppenstall Co. has laboratory report on it.

I regret that I cannot show you my data about it, as they were burnt by the bombed fire and the machines were destroyed by the order from an authority.

Masanori Tani, chief engineer
Cutting Tool Division
Japan Special Steel Co. Ltd.
Tokyo, Japan

• *Mr. Tani's letter and request for data have been forwarded to Heppenstall Co. for action in securing the needed information.*

Focus Shifts to Stainless

Can you send extra copies of your article titled, "Nickel Shortage Shifts Focus to Type 430 Stainless," (STEEL, Aug. 20, p. 66)?

T. V. Simpkinson
Physical Metallurgy Division
Department of Mines & Technical Surveys
Ottawa, Canada

• *Copies forwarded.*

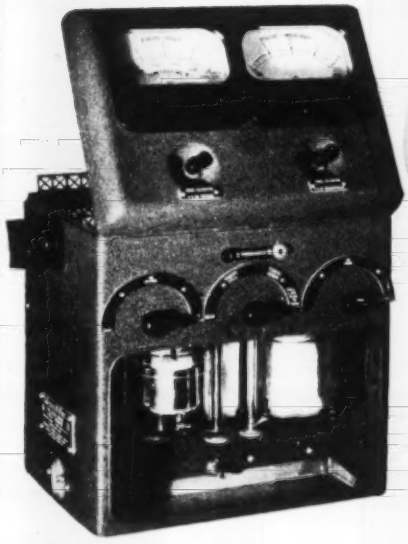
No Longer Free

STEEL's excellent article on the pitfalls of packaging specifications (July 16, p. 70) contained one error . . . . i.e.—the statement that copies of *Indexes of Specifications and Standards* are available without charge. This service was discontinued several months ago. Specifications now can be obtained from Superintendent of Documents, Washington, for $2.75.

Lewis Zarem, information officer
Wright-Patterson Air Force Base
Dayton, O.

• STEEL *got this information in June, when the Munitions Board was still reporting specifications were available without charge.*

I SPY



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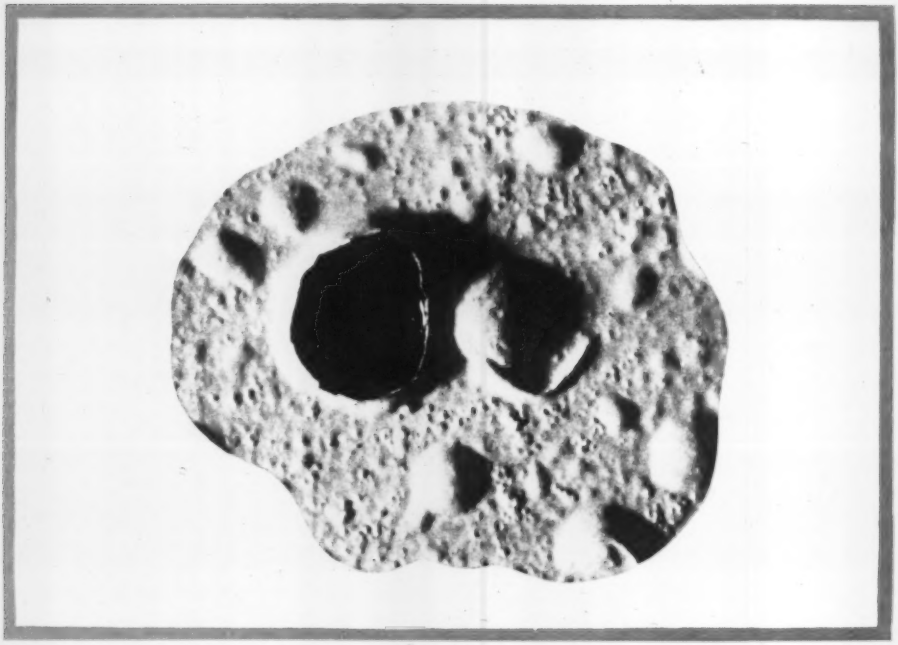

A Penny Saved is a Penny Earned?

Not always! Here's a quick picture of the "saving" of a few pennies on a protective coating! Here's a close-up of the costly corrosion that results!

When it comes to protecting your equipment against chemical attack — don't be "penny wise and pound foolish". Use a truly chemical-resistant coating. Use TYGON "Series TP" PAINT.

In metal finishing plants, TYGON PAINT does an excellent job of protecting such equipment as alkali degreasing units, pickling and plating tanks, barrel platers, fume ducts and hoods, filters, dryers, fans, pumps and piping against corrosive fumes and spillage. Structural steel, walls, and ceilings also benefit from TYGON protection.

Sulfuric acid, hydrochloric acid, hydrofluoric acid, chromic acid, nitric acid, caustic soda, soda ash, trisodium phosphate, the cyanides, the halides, the sulfates, Rochelle salts and organic acids are a few of the metal finishing chemicals resisted by TYGON. In fact, it's unaffected by any plating solution.

Available in a wide range of colors, TYGON PAINT is easily applied and quick drying — requires no more than normally good surface preparation. Once dry, its film is tough, smooth, flexible and non-flammable. It's easy to clean and seemingly ageless, too.

Properly applied, TYGON PAINT is low cost insurance against costly corrosion.

Write, today, for full details and technical data. Ask for Bulletin 720.

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WAYNESBORO, PENNSYLVANIA • U. S. A.

THREAD ENGINEERING DEVELOPMENTS FOR DEFENSE PRODUCTION

Landmaco Machine Adapted for Threading U.S. Navy Rockets

A LANDMACO Threading Machine, through special tooling devised by our Engineering Department, was recently adapted for use by a southwestern manufacturer for the precision threading of 5" Mark 6 Navy Rockets.

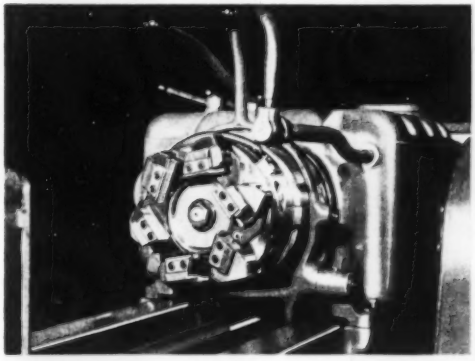
JOB REQUIREMENTS:

Specifications required the generation of 4¾" diameter 12-pitch threads on the rocket head. As a result of the design of the rocket this threading operation had been a trouble spot in the manufacturing process.

Concentricity limits had to be held between thread and the section of the workpiece projecting in front of the thread. It had been difficult to maintain the exact tolerances required. One of the problems arose from the fact that the diameter of the forepart of the projection was larger than the root diameter of the thread. Detailed specifications and engineering drawings of the rocket head are not available for security reasons.

THREADING EQUIPMENT USED:

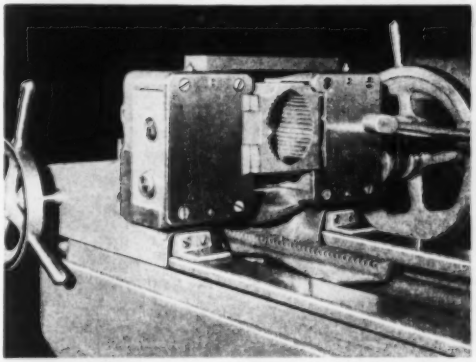
Today precision threads are being cut on these rocket heads at high production rates, and the threads are held to close concentricity. A battery of three 2½" Single Head LANDMACO Leadscrew Threading Machines are used in the operations, each equipped with Special Tooling devised to meet the problems of this specific job.



SPECIAL TOOLING:

1. *40RX LANCO Head.* This head features the use of six chasers, thus distributing the cutting strains over a larger number of threading tools. This results in a finer thread finish and longer tool life.

2. *Receding-type centering pilot.* The bore of each head is fitted with this pilot to maintain close concentricity. The pilot is slightly tapered so that it fits over the front end of the rocket head. Thus, before the work is gripped in the vise, it is engaged by the centering pilot while the head is



open. A relief between the start of the thread and the larger diameter of the projection provides the clearance necessary for the head to close.

3. *Heavy-duty Vise.* It is adjustable both vertically and horizontally. A metal tie is doweled and bolted to the top of the vise as reinforcement to assure maximum strength and rigidity. The vise has round, serrated grips, precision-ground to insure uniform gripping surfaces.

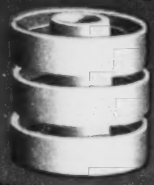
4. *Hammer-blow hand-wheel.* Reduces operator-fatigue to a minimum, precludes slippage of the workpiece and facilitates its removal.

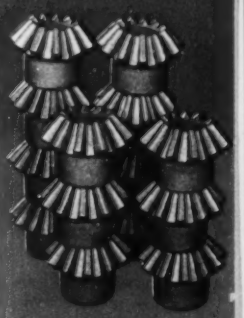
5. *Hand-operated work-stop.* This assures maximum chucking efficiency and uniformity of thread length. The work stop also eliminates one cause of die breakage in that it accurately positions the work axially in the vise to prevent the chasers from striking against work shoulders.

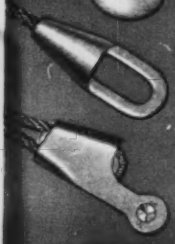
This special adaptation of a standard LANDMACO Machine illustrates the utility of Landis Threading Equipment in the growing expansion of military production. Landis Engineers have helped many manufacturers, just as this one, with their problems in thread production by recommending the proper equipment, and process for the job, and by devising special tooling for the job's unusual requirements. Perhaps your current thread production problem may be solved as successfully as this.

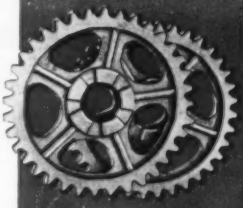
LANDIS MACHINE COMPANY • WAYNESBORO-7, PENNA.

Versatile? That's FARRELL-CHEEK









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FOUR decades of broad experience in the field of producing the finest of highly diversified steel castings has given Farrell-Cheek a wide reputation for versatility. The skills and experiences which have come with forty years of diligent experimentation, research, and development, make Farrell-Cheek the logical source for long-wearing, extremely durable cast steel parts . . . standard or special design . . . either new, or for replacement.

Farrell-Cheek parts are made from carefully selected special steels. Farrell's Carbon Steels, Farrell's "85", and Farrell's Hard Edge, have all been developed for specific qualities which will give parts maximum strength and resistance to wear. Hard Edge has an affinity for depth penetration which can be controlled from 1/8" to 1/4" and permits great durability to be combined with fine machining properties. Farrell's "85", made in either carbon, vanadium, copper, nickel, or chrome combinations with manganese-molybdenum, can be hardened and toughened throughout, and provides superb qualities of toughness, rigidity, and wear resistance.

The fine physical properties of Farrell's cast steels, combined with a wealth of experience in the design and production of a tremendous variety of small to medium castings, makes the Farrell-Cheek name your choice for the procurement of your needs...the one source for the best... with the experience and ability to give you what you want.

FARRELL-CHEEK STEEL CO.

MANUFACTURERS OF HIGHEST QUALITY ELECTRIC FURNACE CARBON AND ALLOY STEEL CASTINGS

FARRELL'S CARBON STEEL CASTINGS
FARRELL'S HARD EDGE STEEL CASTINGS
FARRELL'S "85" STEEL CASTINGS

RAILROAD CASTINGS
Locomotive and Car
& R Specialty Castings

ELEVATOR, CONVEYOR PARTS
Sprockets, Traction Wheels, Chains, Buckets, Rollers, Idlers.

BUSHINGS
Carbon and Alloy Steels Machined, Hardened, Ground.

CRANE WHEELS
Overhead, Gantry, Monorail, Ingot Car, Charging Machine.

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"True Tooth" Gears and Pinions, Sheaves and Wheels.

SPECIALIZED CASTINGS
Light Section Castings

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YOUR INQUIRY WILL PROMPTLY BRING DETAILED INFORMATION PERTAINING TO ANY OF THE ABOVE FARRELL-CHEEK PRODUCTS

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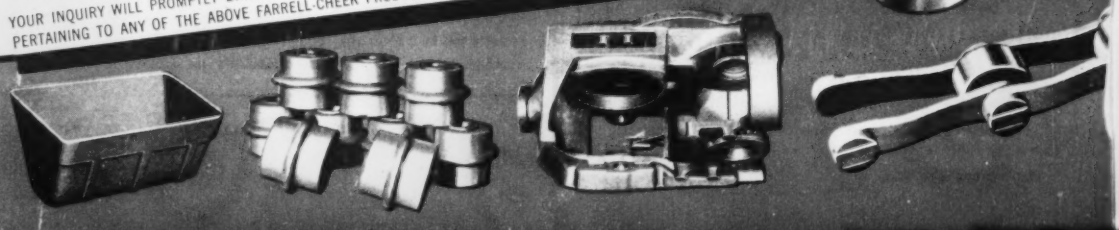
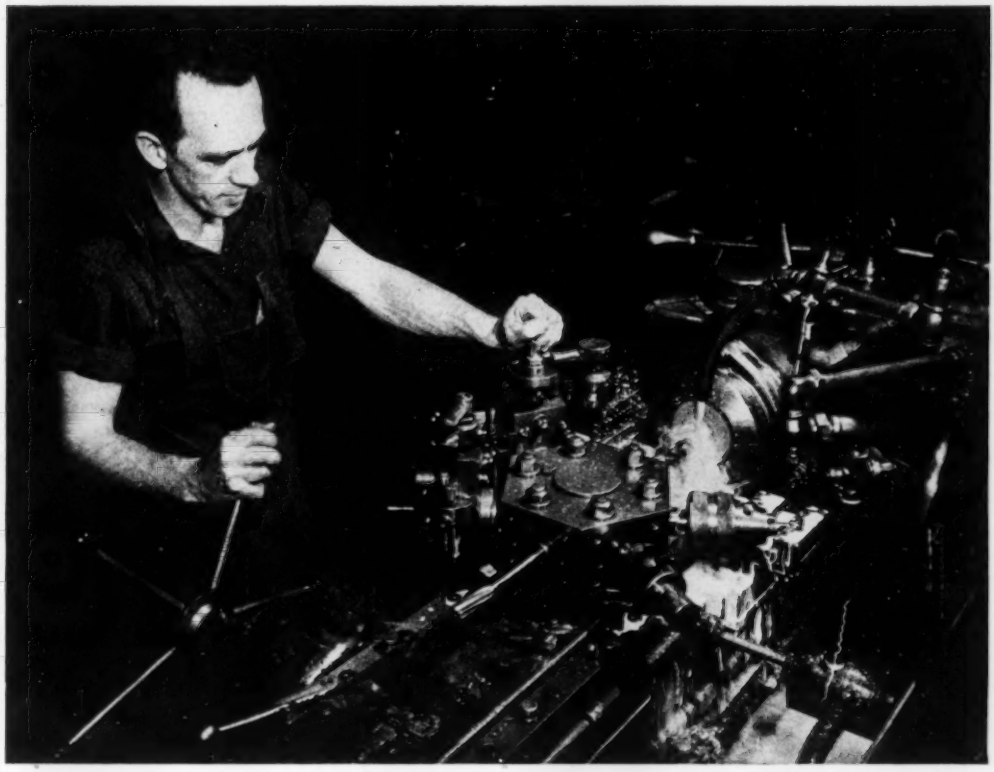


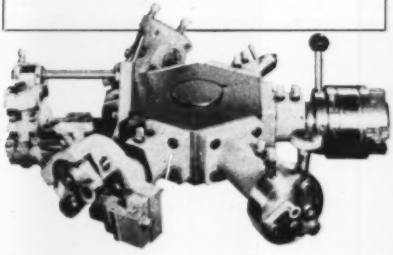


PICTURE OF A MAN PRODUCING 25% MORE

Same job, same operation, but Better Tools!

● This shop has found it can do more jobs faster on Warner & Swasey Turret Lathes with the Standard Tooling Setups that fit their requirements. Multiple and combined cuts, with shorter setup time, mean profitable production increases.

ELECTROL INCORPORATED, of Kingston, New York, transferred this precision Stop-Plunger job to a Warner & Swasey No. 3 Universal Turret Lathe because it had the speed and accuracy required, as well as the proper tooling for the job. The result was a 25% increase in production of this high pressure hydraulic control part.

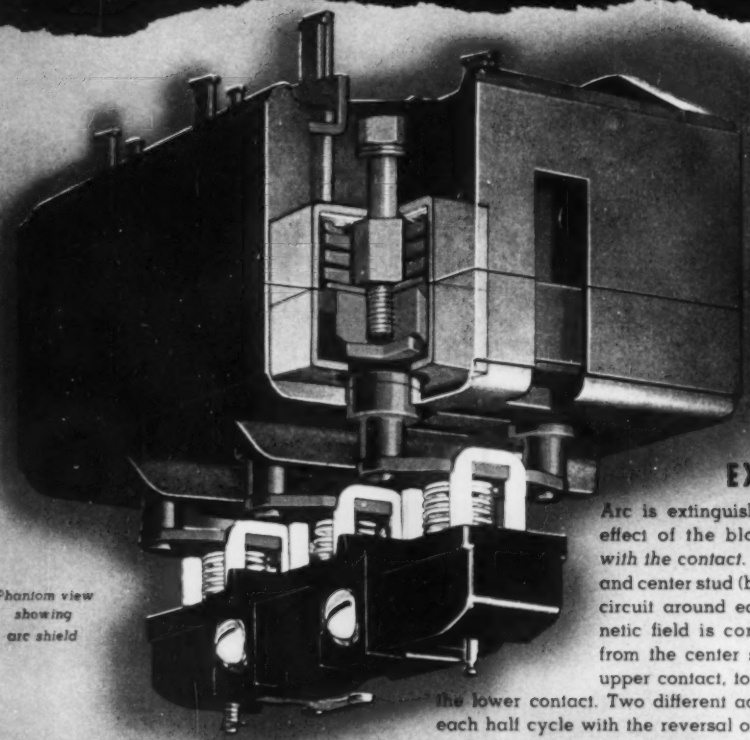


Permanent Universal Tooling set-ups and the right tools which can help you increase your output are all in the new 204 page Warner & Swasey Tool Catalog. Write for your copy.

WARNER & SWASEY
Cleveland

YOU CAN MACHINE IT BETTER, FASTER, FOR LESS WITH WARNER & SWASEY TURRET LATHES, AUTOMATICS AND TAPPING MACHINES

The All New CLARK TYPE "CY" AC MOTOR—



Phantom view showing arc shield

Here's how the ARC is EXTINGUISHED

Arc is extinguished by applying the effect of the blow-out coil *concentric with the contact*. The steel arc chamber and center stud (blue) form the magnetic circuit around each contact. The magnetic field is concentrated in a cone from the center stud that supports the upper contact, to steel rim surrounding the lower contact. Two different actions occur, changing each half cycle with the reversal of the current.

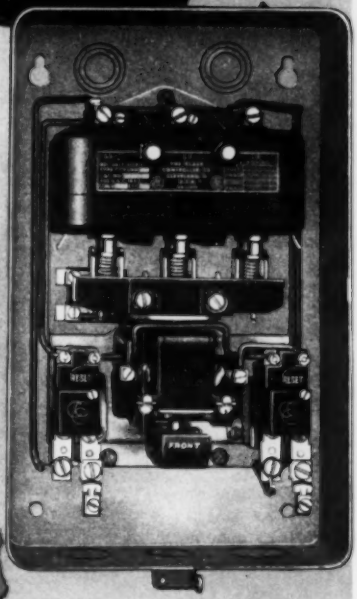
In one current direction the arc is forced to the outer edge of the upper contact, lengthened and rotated. In the other, the arc is rotated and forced to the middle of the upper contact. In each case, the magnetic field tends to quench the arc, either by lengthening it or confining it.

Constant forced rotation of the arc, moving continually from a hot to a cold spot, minimizes burning and pitting of contacts.

Let a CLARK application engineer show you what this BLUE RIBBON PRODUCT means to you in increased production and lower maintenance.

CLARK ENGINEERED ELECTRICAL CONTROL

— STARTER features an entirely new principle in ARC INTERRUPTION



Another CLARK First! In the Type "CY," CLARK offers, for the first time, a line of AC Motor starters that gives you the extra protection of "Mill-Type" heavy-duty construction and design. These new starters feature the combined use of strong multi-turn magnetic blow-outs and twin-break contacts* to achieve a new high in arc-interrupting efficiency.

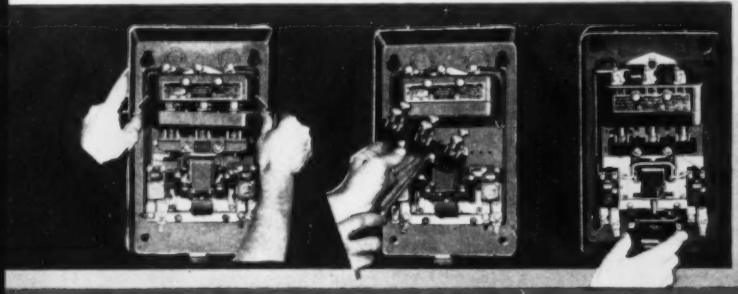
Other important advantages include:

- One piece upper arc shield, closed at the top, to prevent accumulation of hot gases between wiring terminals, minimizing phase-to-phase failures.
- Magnetic arc interrupters in steel arc chambers.
- Silver alloy double break contacts.
- Melting-alloy type overload relays.
- Vertical-lift clapper type magnet with straight line guided movement, using no springs.

*Magnetic blow-out coils are used on all Size 2 and 3 "CY" Starters. Sizes 0 and 1 use the same general Mill-Type construction as larger sizes.

The Maintenance Man's Dream

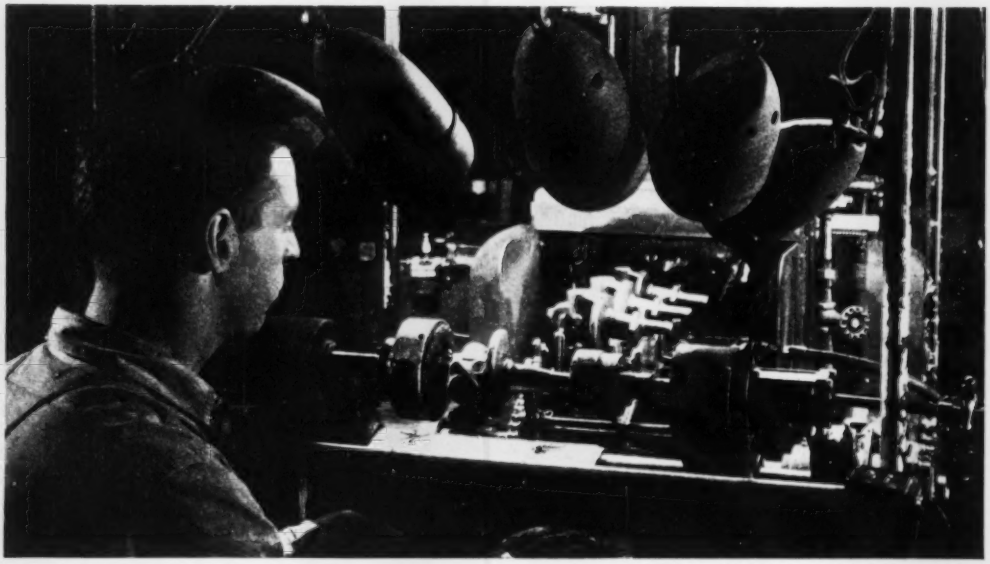
The new arc interrupting principle and twin-break silver-alloy contacts, assure longer contact life. No filing, dressing or cleaning of contacts is required. Inspection and maintenance are further simplified by design features.



- **No tools needed to inspect contacts.**
- **Moving contacts easy to change.**
- **Stationary contacts quickly changed.**
- **Remove only two screws and one pin to change coils.**
- **All parts removable from the front.**

THE CLARK CONTROLLER CO.

1146 EAST 152ND STREET • CLEVELAND 10, OHIO



Inspection station of Magnaflux-Magnaglo Type MAL-3 Unit. Parts are loaded onto unit's endless conveyor and automatically processed with Magnaglo. Pertinent defects show up, marked with a glowing fluorescent indication under black light.

at Studebaker

Semi-Automatic **MAGNAFLUX*** Inspection Unit Saves Up to 32 Inspector-Hours per Shift . . .

100% INSPECTION at PRODUCTION LINE SPEED!

For parts so vital to safety as steering knuckles, knuckle pins and arms, the Studebaker Corporation insists upon 100% inspection. This Magnaflux-Magnaglo* Conveyorized Inspection Unit is more than living up to expectations — *and achieving multiple-savings besides.*

With this Magnaflux-Magnaglo Unit and a two-man team, up to 3800 steering knuckles are inspected per 8-hour shift. This compares with 3600 inspected parts per 6-man team previously . . . and represents a saving of 4 men or 32 man-hours per shift! Similar savings are realized in inspection of other steering components.

In addition, machining time on defective parts is eliminated, and more salvage made possible. Shot-blasting instead of expensive pickling of forgings is now possible, at greatly reduced cost.

Even if your inspection needs are not like those at Studebaker, Magnaflux can in all probability provide the effective answer — and achieve similar savings in man-hours and materials. Invite an experienced Magnaflux Engineer to discuss your problems soon.

•

Write for newly edited booklet of detail: "Maintaining Quality Standards in Industry."

MAGNAFLUX CORPORATION

Reg. U.S. Pat. Office

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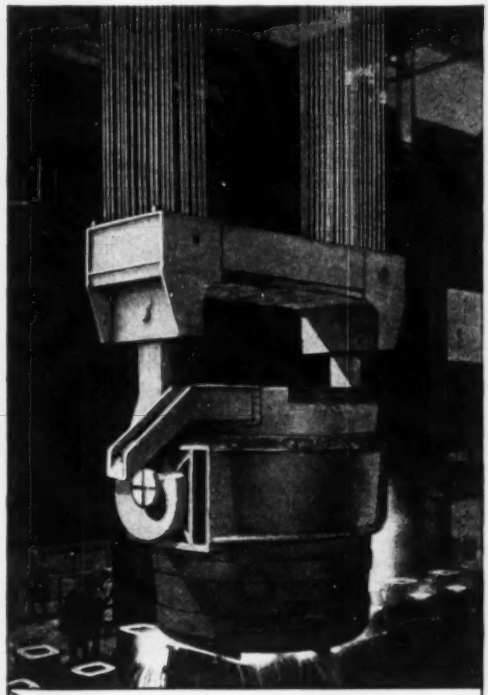
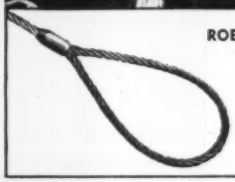
Export Distributor: Curtis Wright Corp. *In Canada:* Williams & Wilson, Ltd.

WIRE ROPE





ROEBLING ALL-PURPOSE SLINGS with the Tapered Sleeve Splice come to you ready for the job. They cost less than tucked splices . . . have the full strength of the rope. Send for the full story.

Roebling "Blue Center" Preformed works better . . . lasts longer . . . cuts costs

"BLUE CENTER" STEEL wire rope is an exclusive Roebling development. Its high resistance to abrasion, shock and fatigue spells long life. In addition, Roebling Preforming gives you a rope that is easy to handle . . . has better spooling qualities . . . reduces vibration and whipping. This combination makes Preformed "Blue Center" Steel Wire Rope a top performer on the job.

Roebling makes a complete line of wire rope . . . there's a construction for every installation. Have your Roebling Field Man help choose the *right* rope for your equipment. Get his advice on the correct use and maintenance of wire rope. It is based on performance records on thousands of installations. John A. Roebling's Sons Company, Trenton 2, New Jersey.

ROEBLING

Atlanta, 934 Avon Ave ★ ***Boston,*** 51 Sleeper St ★ ***Chicago,*** 5525 W. Roosevelt Rd ★ ***Cincinnati,*** 3253 Fredonia Ave ★ ***Cleveland,*** 701 St. Clair Ave, N.E. ★ ***Denver,*** 4801 Jackson St ★ ***Detroit,*** 915 Fisher Building ★ ***Houston,*** 6216 Navigation Blvd ★ ***Los Angeles,*** 216 S. Alameda St ★ ***New York,*** 19 Rector St ★ ***Odessa, Texas,*** 1920 E. 2nd St ★ ***Philadelphia,*** 230 Vine St ★ ***San Francisco,*** 1740 17th St ★ ***Seattle,*** 900 1st Ave, S. ★ ***Tulsa,*** 321 N. Cheyenne St ★ Export Sales Office, ***Trenton, N. J.***

WHEN YOU LOOK TO TOMORROW . . . *today!*

Tomorrow's performance of the pumps you select *today* is an important first consideration! Will they be efficient for years . . . will they be easy and economical to service and maintain? These are the questions that should guide today's pump buyer.

In Fairbanks-Morse Pumps, you can be sure of these important advantages. Take the Fairbanks-Morse Pomona Vertical Deepwell Turbine Pump, for example. A new, water-lubricated external sleeve bearing assembly assures longer life wearing surfaces . . . minimum friction and shaft bearing losses . . . simple, easy replacement of worn sleeves.

This new feature and the many other Pomona advantages are your assurance that the pump you buy today will be efficient and economical tomorrow . . . *and for years to come.*

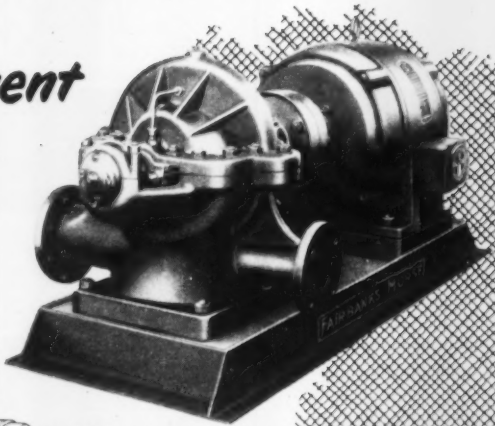
Water lubricated, external sleeve bearing assemblies assure maximum life for bearing assemblies without sacrifice of line shaft streamlining or bowl efficiencies.

FAIRBANKS

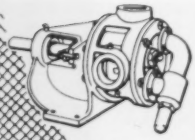
A NAME WORTH

AND, FOR ANY *Pumping Requirement*

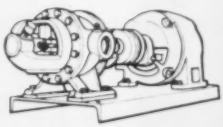
. . . you'll find a dependable, efficient Fairbanks-Morse Pump that will give you a new conception of low-cost pumping. Whether you need a centrifugal . . . a rotary . . . sewage or trash pump . . . turbine . . . vertical or horizontal angle-flow, you'll find the size and capacity you want in the Fairbanks-Morse line. This completeness of line is an important advantage to you . . . you can simplify your ordering . . . your parts and service . . . your inventory by standardizing on a single source, Fairbanks-Morse.



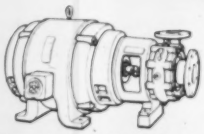
Horizontally split case centrifugal pump



Rotary pumps



Westco Turbine pumps

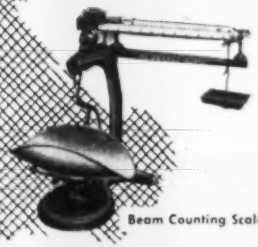


Builtogether centrifugal pumps

YOU CAN *Count* ON THIS SCALE . . .

You can count small parts or pieces, with Fairbanks-Morse Counting Scales easily and accurately *by weight!* They save time . . . save money . . . eliminate errors. Whether you manufacture or buy small parts in quantity, these accurate counting scales are one of your biggest aids in inventory control, in estimating cost work and in determining the volume of piecework.

With the *exact* counts you get, you eliminate the possible loss of customer good will over "short count" shipments . . . assure better labor relations through accurate piecework records and less fatiguing inventory work. You'll find it pays to "count on" a Fairbanks-Morse Counting Scale.



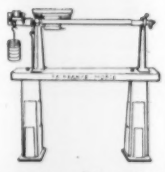
Beam Counting Scale

Dial Counting Scale

MORSE
REMEMBERING

AND, TO SPEED AND SIMPLIFY
Industrial Weighing

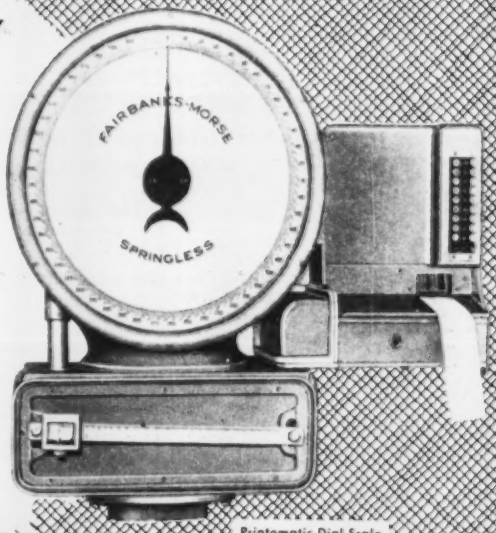
. . . you'll find the complete line of Fairbanks-Morse Scales your best answer. These accurate weighing instruments make reading easy . . . minimize the chance for human error. Designed for sustained accuracy, these dependable weighing instruments cut the costly little weighing errors that can mount up to so much lost profit. Your Fairbanks-Morse weighing expert will be happy to check your weighing operations with an eye to elimination of costly errors and faster weighing operations.



Full Capacity Beam Scale

Bench Dial Scale

Portable Dial scale



Printomatic Dial Scale

..YOU WANT THIS ROTOR DESIGN...

It's Copperspun!

If you buy or use motors, chances are that most of them are of the polyphase squirrel cage type — the most widely used class of integral horsepower motors made — for sustained heavy-duty drives in almost every class of service.

In rotor design, such service separates the good from the poor — and highlights your need for Fairbanks-Morse motors with Copperspun rotors, made through an exclusive centrifugal casting procedure developed by Fairbanks-Morse.

For in Copperspun rotors, you get the benefits of superior electrical characteristics — plus a design that is mechanically stronger for withstanding the most severe working conditions.

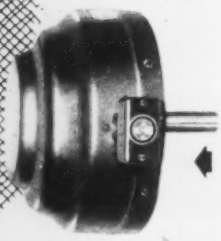
FAIRBANKS

A NAME WORTH

FOR POLYPHASE SQUIRREL-CAGE MOTORS

with Copperspun Rotors!

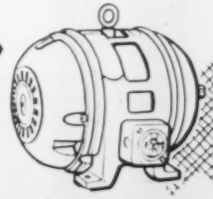
Here are a few in the complete Fairbanks-Morse line



GENERAL PURPOSE, drip-proof motors mountable in any position with full protection against flying chips, falling particles, dripping liquids, etc.

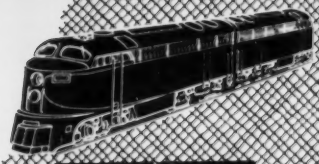
AXIAL AIR-GAP MOTORS: Averaging 30% lighter and 40% shorter overall—with flywheel effect three times that of corresponding ratings of conventional motors. Add to appearance, decrease size and weight of any driven machine. Meet all AIEE and NEMA standards.

TOTALLY ENCLOSED FAN-COOLED motors operate economically, safely under adverse conditions, including corrosive gas, vapors, steam or where metallic particles, abrasive dust and/or other materials are in the air. Available with Underwriters labels for use in Class 2, Group G hazardous locations.



Why Our Best Customer is Hard to Satisfy

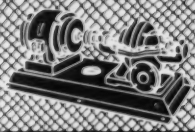
Perhaps the "best customer" for Fairbanks-Morse products is Fairbanks-Morse itself — for all Fairbanks-Morse products are components of and/or used in the manufacture of all other Fairbanks-Morse products. Fairbanks-Morse diesel locomotives, for instance, prove up the design advantages of Fairbanks-Morse Opposed-Piston diesel engines, electrical equipment and pumps — all of which have broad preference in many separate and specific industries. Fairbanks-Morse pumps are driven by Fairbanks-Morse motors . . . Fairbanks-Morse raw materials are weighed through manufacture by Fairbanks-Morse scales . . . a continuing close interrelationship between research, design, manufacture and use that results in products that are designed and built from your standpoint . . . that assures your good judgment in buying from Fairbanks, Morse & Co., Chicago 5, Ill.



Diesel Locomotives: For yard, switcher, transfer, suburban, freight and high-speed passenger service.

Diesel Engines: For all stationary and marine service including dual fuel applications.

Scales: For every weighing operation: including truck scales, railroad track scales, dial, beam, belt conveyor, counting, and Printomatic scales.



Pumps: Vertical, deep well, centrifugal and rotary pumps of all sizes, also specialized pumps for the widest range of applications.

Home Equipment: Lighting plants, home water systems, water softeners, mowers, etc.

Electric Motors: Complete range of size and types to assure unbiased recommendation, correct motor application.

FAIRBANKS-MORSE

REMEMBERING

THESE ARE YOUR FAIRBANKS-MORSE SALES CENTERS

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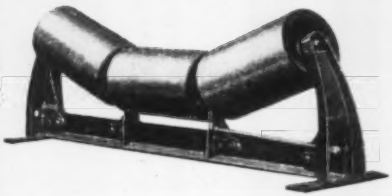
2 ways L-B Belt Conveyors
cost you less in the long run

1 LINK-BELT Idlers require minimum lubrication and adjustment



BY MINIMIZING maintenance . . . holding "down-time" to a new low . . . reducing power requirements — Link-Belt Roller Bearing Idlers save you money.

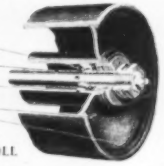
And, because of standardized design, Link-Belt gives you the famous "100" Idler or the heavy-duty "200" Idler at a cost lower than you'd expect. You can choose from the full Link-Belt line of troughing, impact-cushioning, belt training and flat belt idlers in a wide range of roll diameters and belt widths. A complete line to meet any requirement.

Grease-in, dirt-out, cartridge type unit seal preserves lubricant. No springs, no loose parts, no sliding metal-to-metal contact.

Large grease reservoir prolongs lubrication intervals.

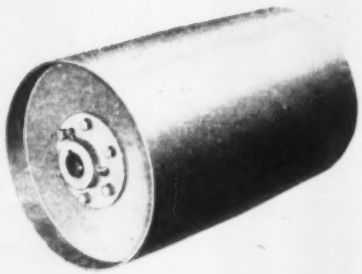
Precision roller bearings maintain alignment.

Concentrically counterbored and journaled full-length central tube and counterbored roll shell are continuously welded to dished heads to maintain balance and bearing alignment.



CUTAWAY OF "100" ROLL

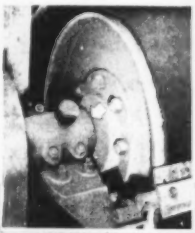
2 LINK-BELT Welded Steel Pulleys minimize shaft deflection



MODERN Link-Belt welded steel design gives you lower maintenance and longer pulley life in more ways than one. Water- and dust-tight construction preserves balance, halts corrosion. Removable hubs — key-seated in line with two set-screws — are interchangeable with many other shaft sizes.

And for reducing shaft deflection (see below), you can't possibly get better protection than with Link-Belt Welded Steel Pulleys.

Since shaft bending moment increases in proportion to the distance between shaft bearing and pulley hub, it's easy to see why Link-Belt Welded Steel Pulleys are your best bet. Note how the bearing support and hub of the pulley are mounted with minimum clearance. That's possible because Link-Belt hubs are flush with the pulley face.



BELT CONVEYORS

LINK-BELT

LINK-BELT COMPANY: Chicago 9, Indianapolis 6, Philadelphia 40, Atlanta, Houston 1, Minneapolis 5, San Francisco 24, Los Angeles 33, Seattle 4, Toronto 8, Springs (South Africa). Offices, Factory Branch Stores and Distributors in Principal Cities.

. . . IT'S THE Cost per Cut THAT Counts

Study these high production, low cost figures on three Motch & Merryweather Circular Sawing Machines

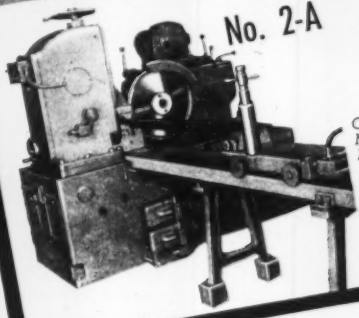
Make your own study of the cost per cut in your metal-sawing department. Then find out from Motch & Merryweather how much production at lower cost you can get on M. & M. Circular Sawing Machines, using our Triple-Chip blades.

Operation: Steel door frames (mitre cut).
Material: Rolled steel shapes 6" wide x 1/16" thick.
Production: 200 pieces per hour.
Tool cost per piece: $.0002.

No. 00-G

M. & M. No. 00-G Circular Sawing Machine. Manual or automatic stock feed. Readily adaptable to making cuts at angles up to 45° as well as high production square cut-off. Capacity: up to 3" diameter round; shapes—up to 3-3/8" x 6".

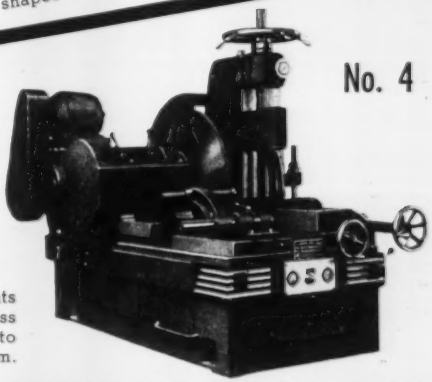
No. 2-A



Operation: Rocket nozzle stock cut to length.
Material: S. A. E. 1020, 5" diameter.
Production: 60 pieces per hour.
Tool cost per piece: $.001.

The No. 2-A machine pictured at the left has automatic stock feed up to 72" cut-off lengths. It is offered also with manual stock feed. Capacity: up to 6-1/2" diameter round; structural shapes—up to 5" x 12".

No. 4



Operation: Forging billets cut to length.
Material: S. A. E. 1045, 14" square.
Production: 6 pieces per hour.
Tool cost per piece: $.12.

No. 4. Widely used in steel and structural steel plants and forge plants sawing all types of forging, stainless and titanium alloys, die block steel, etc. Capacity: to 17" dia. round; structural shapes up to 24" I-beam.

Manufactured by

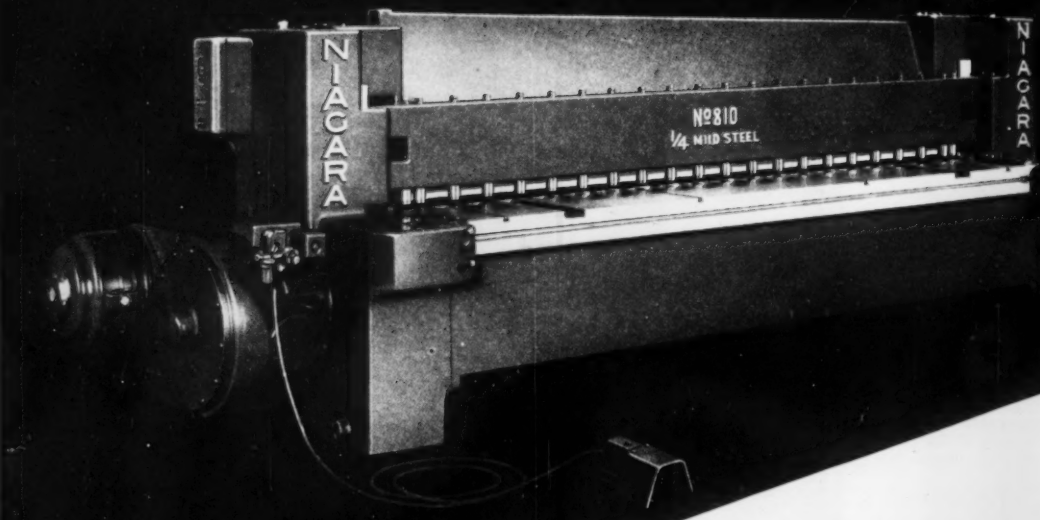
THE MOTCH & MERRYWEATHER MACHINERY COMPANY
715 PENTON BUILDING • CLEVELAND 13, OHIO
Builders of Circular Sawing Equipment, Production Milling, Automatic and Special Machines

PRODUCTION-WITH-ACCURACY MACHINES AND EQUIPMENT

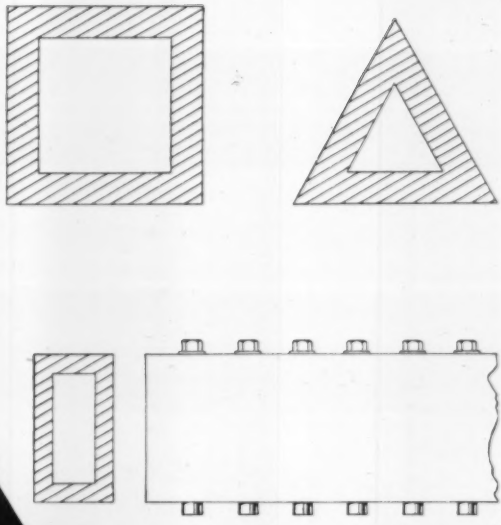
NIAGARA

Accuracy in a squaring shear is dependent on rigidity of the shear's components and not upon any individual feature. Sturdiness, convenience, speed and dependability are the result of experienced engineering and superb manufacture.

Latest type Niagara No. 810 Power Squaring Shear. Arranged with electro pnuematic tripping device operated by foot switch.



BASIC SHEAR DESIGN Results in Accurate Cutting



● BED, CROSSHEAD, HOLDDOWN and HOUSINGS in NIAGARA UNDERDRIVE SHEARS are box sections to resist with minimum deflection the horizontal, vertical, diagonal or torsional stresses to which every shear is subjected. No other section will do the job as efficiently. This construction results in extreme strength and rigidity without resorting to deep beam sections which, in the bed, necessarily project below the floor line.

The simple, mechanically operated holddown having individual self compensating pressure feet, performs all required functions of a good holddown efficiently, effectively and quietly without using complex hydraulic circuits, pumps, valves, packings, cylinders, etc. and without generating heat. Maintenance costs are held to a minimum.

The drive is thru efficient spur gears mounted on anti-friction bearings and running in oil. It employs the famous Niagara 14 point instant engaging sleeve clutch. There are no sliding surfaces such as in worm gears and friction clutches to consume power, generate heat, and to wear rapidly.

For Your Defense Production

NIAGARA MACHINE & TOOL WORKS • BUFFALO 11, N. Y.

Manufacturers of Presses, Shears, Machines and Tools for Plate and Sheet Metal Work

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MADE TO FIT RIGHT, HOLD TIGHT!

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BOLTS AND NUTS

Clean, accurate threads...sound, full heads...straight, strong shanks! These qualities never vary in Republic Upson Products . . . sound assurance of proper fit every time and a tight hold on every assembly.

More than 20,000 shapes and sizes provide a full-line assortment for standard bolt and nut needs. Why not make it your source of supply?

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REPUBLIC STEEL

SHEAR
COIL BOX
Recently installed, this special cold reduction unit is one of many Bliss mills and accessories to be seen in leading European metal plants
UPENDER
SLITTER
SCRAP BALER
REVERSING MILL

Modern BLISS Mills and Accessories boost European steel production

New production records recently reported by leading European steel plants can be directly traced to many Bliss installations. That's because Bliss engineers have long recognized that truly efficient mill production can only be achieved by maximum use of properly designed metal-handling machinery.

During the past year alone, Bliss Rolling Mills and Accessories—2-high, 4-high, 6-high—levelers, coilers, reels, rewinders, slitters, shears—have revitalized mill lines in Italy, Sweden, Belgium and Switzerland by speeding metal transfer to and from hot and cold rolling mills.

You, too, can step up your plant efficiency by looking to Bliss for rolling mills and accessories. Here's a good way to start. **Write for your copy of the new Bliss 52-page brochure, including the complete range of rolling mill machinery and valuable engineering tables you will want for ready reference.**

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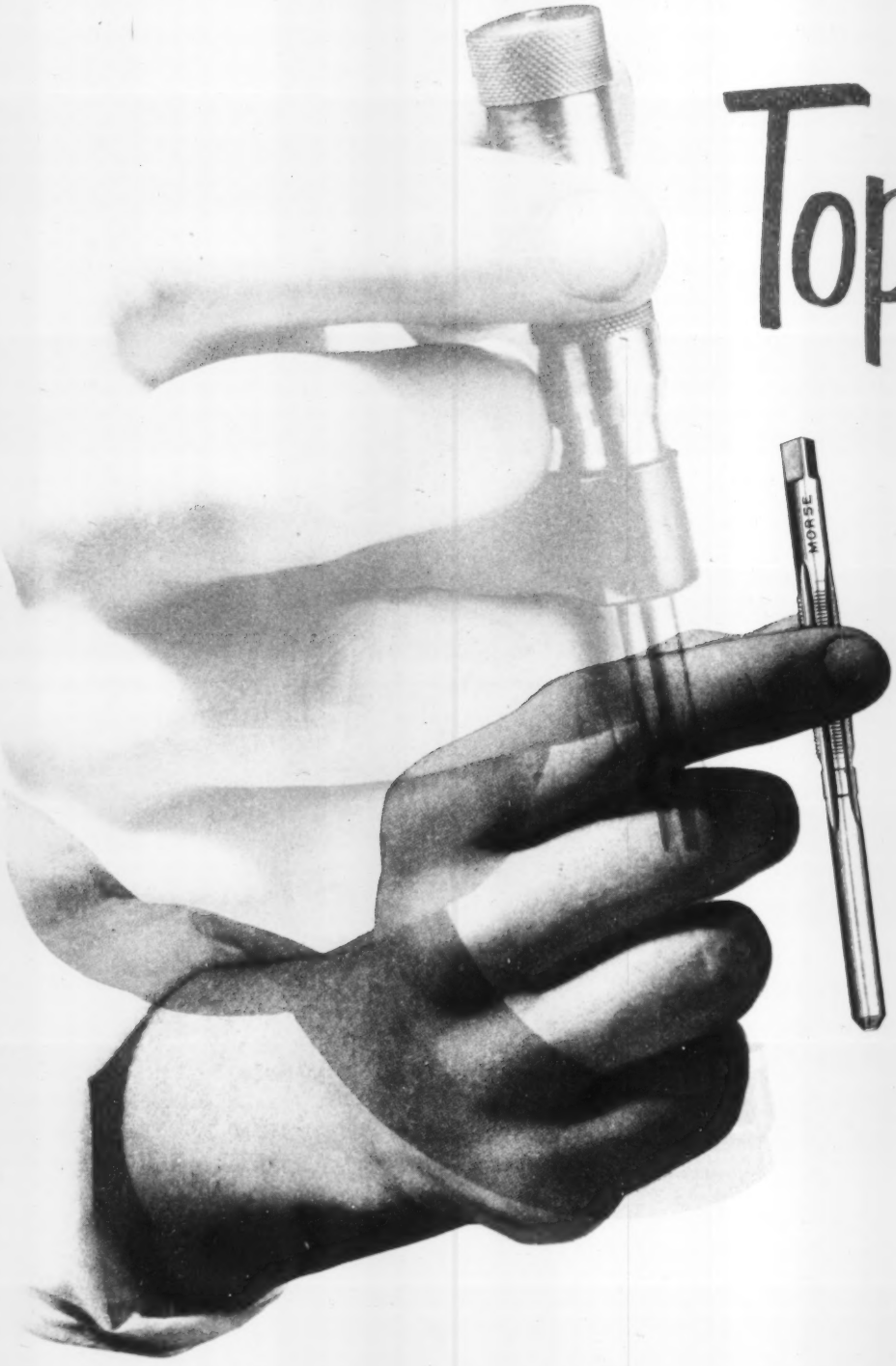
Top



Toolmakers Use MORSE TAPS

... because they tolerate "No Compromise with Precision"

Look at a Morse Micrometer Tap, as this toolmaker is doing . . . and you're looking at *a finely wrought piece of industrial jewelry.*

And that goes for *all* Morse Taps of every type . . . high-speed or carbon . . . cut-thread or ground . . . regular or special . . . plain or Electrolized. For Morse makes them *all: Spiral-pointed taps* to drive the chips ahead in through-holes . . . *Spiral-fluted taps* to draw the chips out of bottomed holes . . . *Straight-fluted taps* for jobs where the set-up indicates *they'll* work best.

So for any tapping job . . . in ferrous or non-ferrous metals, plastics or die-cast . . . remember that if you want Morse-Quality workmanship (cleaner, stronger threads that cut far faster, with longer tap life) then you'll find you *have* to buy genuine Morse Taps. See your Morse-Franchised Distributor now, for the top taps for *your* job.

Morse Twist Drill & Machine Company
NEW BEDFORD, MASS.
(Div. of VAN NORMAN CO.)
Warehouses in New York, Chicago, Detroit, Houston, San Francisco

MORSE
Cutting Tools

HOW WOULD YOU MACHINE A 140 TON CASTING

HERE'S HOW

G. & L. MACHINES READILY PRODUCE HEAVY DUTY FORGING MACHINE PARTS

A 280,000 lb. piece of metal is a brute to handle! Yet when this heavy forging machine component is placed on a floor type Giddings & Lewis Horizontal Boring, Drilling and Milling Machine it becomes a *routine shop job.* The reason—G. & L.'s offer a simple means of work mounting which eliminates staggering setup problems common to other types of equipment. Certainly the part could be twice this size and still be machined easily and accurately. And—

G. & L. MACHINES EFFECTIVELY PRODUCE OTHER FORGING MACHINE PARTS . . .

Like this tough alloy steel forging hammer ram having a 5' 6" long taper bore. Overall time to bore this ram on the G. & L. is 18 hours as compared to 36 hours when handled differently.

If metal must be removed fast, such as the cavitation in the forging die bolster, the G. & L. machine responds 55% faster than the time formerly required for the same operations. Thus—

It is common sense to investigate the multiple machining advantages inherent in G. & L. machines when you are confronted with unusual production problems. There is a way to do your work and G. & L. engineers will show you how.

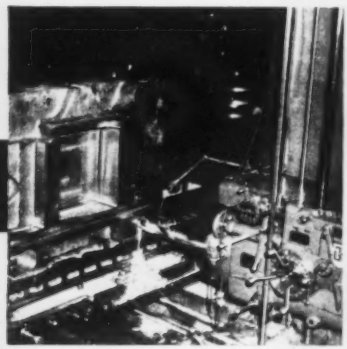


Photo Courtesy Ajax Manufacturing Co., Cleveland, Ohio

Boring, drilling and milling operations are performed on this bolster for a 5000-ton upsetter 55% faster and more efficiently on the 350-T G. & L. horizontal boring machine.

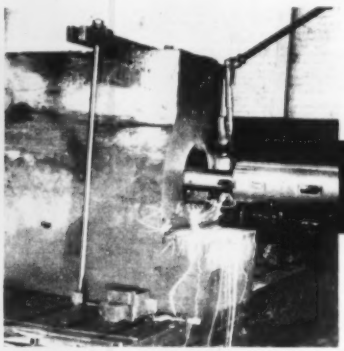


Photo Courtesy Erie Foundry Co., Erie, Pa.

Hammer rams like this are completely machined 50% faster on G. & L. equipment.

G&L

HYPRO

DAVIS

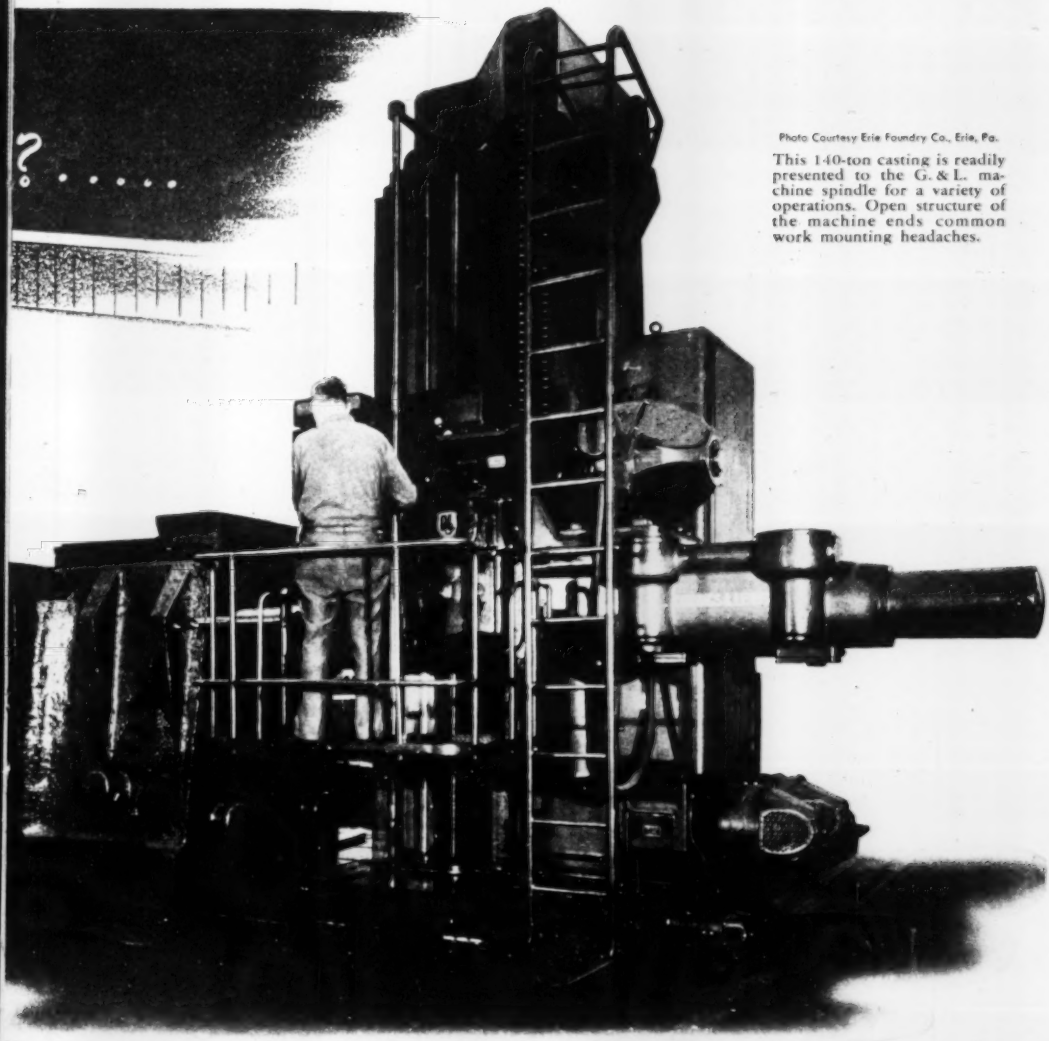


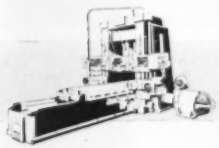
Photo Courtesy Erie Foundry Co., Erie, Pa.

This 140-ton casting is readily presented to the G. & L. machine spindle for a variety of operations. Open structure of the machine ends common work mounting headaches.

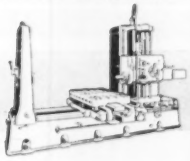
GIDDINGS & LEWIS MACHINE TOOL COMPANY

FOND DU LAC, WISCONSIN, U.S.A.

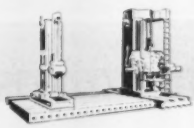
G. & L. HYPRO
Double Housing Planer



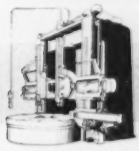
G. & L. Table Type
Horizontal Boring Machine



G. & L. Floor Type
Horizontal Boring Machine



G. & L. HYPRO Vertical
Boring and Turning Mill



ONCE AGAIN the nation's steel production depends on you!

scrap

FOR THE SAKE OF AMERICA!

Scrap iron and steel are vital to the production of steel . . . and America's mills are turning out over 100 million tons of ingot steel annually. That takes a *lot* of *scrap!*

Yet lack of scrap may cause steel production to *sag* . . . right when our nation needs more steel than ever. And there's only one way to meet the need: Get in *all* the scrap that you can, *now*.

You can help now . . . this way

Check your plant or factory—check the grounds, too. Gather up all the scrap steel—old or obsolete machinery and equipment, rusting tanks and boilers, rails and sheets. Your local scrap dealer will pay you today's good prices and start this vitally needed material on its way.

Production is the key to solution of many national problems . . . and production requires steel. Help keep production high by getting in the scrap!

WEIRTON STEEL COMPANY

WEIRTON, WEST VIRGINIA

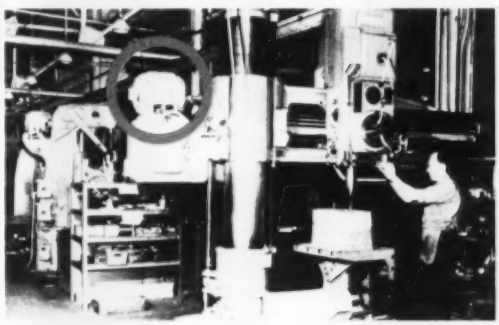
NATIONAL STEEL CORPORATION

"We have three shifts in operation," says Julius J. Domonkos, Vice-President in Charge of Manufacturing, Bell Aircraft Corporation. "That's full production on a 24-hour day basis. For the past 10 years we've been depending on Tri-Clad motors to carry the load. We've never regretted putting our confidence in this fine motor!"

G-E Tri-Clad Motors drive the machines that are instrumental in producing helicopters, guided missiles, rocket motors, research aircraft, and jet aircraft engine nacelles for our rapidly expanding armed forces. At Bell Aircraft Corporation, G-E Tri-Clads are known as a thoroughly dependable motor —tough on the outside . . . on the inside . . . at the bearings.

BELL AIRCRAFT CORPORATION:

"We've been depending on Tri-Clad* Motors for Ten Years . . ."



This Tri-Clad driven radial drill takes care of most of the large dies for the entire Bell plant. Big dies and bolster plates are drilled and tapped on this machine, a critical part of the Bell operation. Despite continuous use, plant personnel can't remember a single interruption due to Tri-Clad failure!

FASTEST BOMBER IN THE WORLD! Jet engine nacelles for the 600-plus miles-per-hour B-47 are being produced at a record-breaking clip in the Bell plant at Buffalo, N. Y. The "Stratojets" represent a major advance in bombardment aircraft.

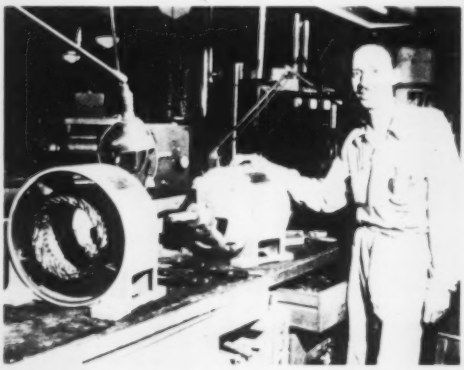
*Reg. trademark of General Electric Co.

GENERAL ELECTRIC

TRI CLAD MOTORS

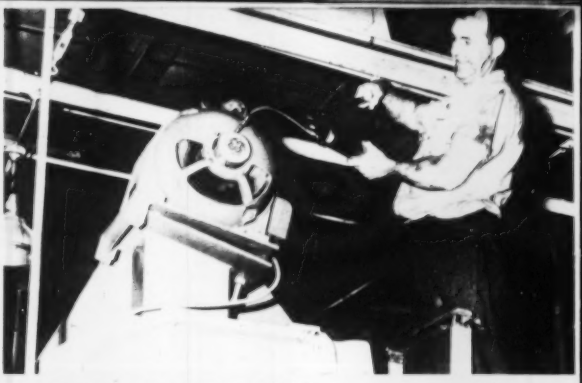
Help keep Bell Aircraft production up!

Marvin Limburg (left), Foreman of Bell's Tool and Die Shop, comments, "I don't believe we've ever lost machine time due to breakdown of Tri-Clad motors. And our jig-borers, for example *have been operating around the clock for the last 8 to 10 years.*"

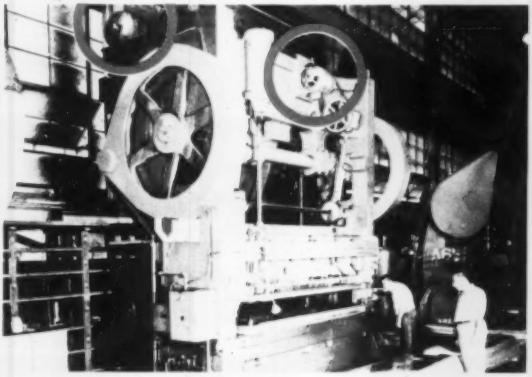


"It's the easiest motor we have to maintain" according to Maxwell Anderson, Crew Chief of Bell's motor repairmen. "There's more working room inside and more room in the slots. It's become a byword with us that if you give a Tri-Clad motor ordinary care you'll never have to worry about maintenance."

TIMELY READING—With every electric motor needed on the line, you'll want a copy of the G-E manual on "How to Maintain Motors and Generators." It's free; just ask for bulletin GET-1202. *Sect. 752-10, General Electric Company, Schenectady 5, N. Y.*



Greasing isn't necessary on a Tri-Clad motor in normal service, but it's always reassuring to know that you *can* lubricate if you so desire, without time-consuming disassembly. The photo shows how easy it is: remove relief plug, attach the grease gun nozzle, squirt—the job is finished.



This huge punch press is an important tool maker. Anton Geiser (right), assistant punch press foreman, says: "I can't recall a single shutdown of this section due to motor failure." Almost all motors in this department are Tri-Clad. This is another Bell Department which has been operating around the clock; cannot afford to lose time because of motor breakdown.

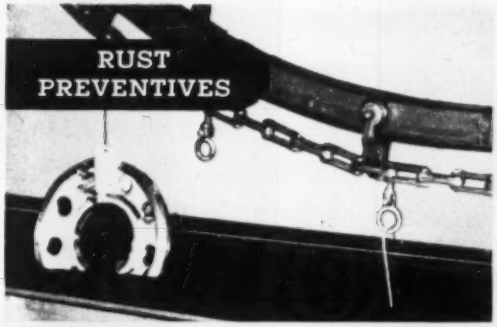
NEW! A Helpful Training Course on Motors!

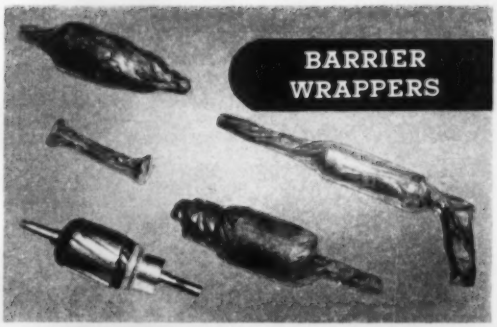
Everyone concerned with technical training problems will want this new G-E Motor Selection and Application Course. Consists of 9 short, easily understood lessons. Complete kit —slide films, review booklets and instructor's manual— $100.00. Call or write your nearest G-E sales office.

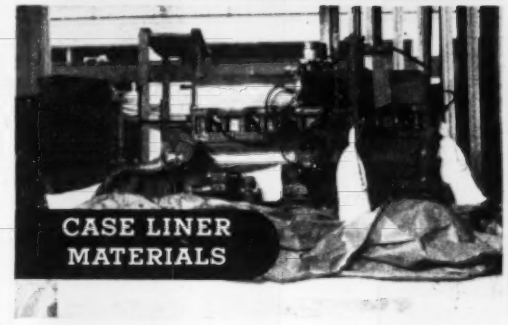
Look at the Scope of this Course

1. Fundamentals of Motors
2. Types of Motors
2. Fundamentals of Selection
4. A-C Induction Motors
5. Single-phase Motors
6. D-C Motors
7. Synchronous Motors
8. Adjustable-speed Drives
9. Gear Motors

GENERAL ELECTRIC







Valuable information on how to package

your government orders

Packaging machines and parts to government specifications calls for specialized experience and materials. In this vital step in completing a government order Dearborn can help you.

Dearborn stands ready to supply the government specified materials you will need. These include the rust preventives, wrappers and sealers for the widely known Method IA . . . case liners . . . fingerprint neutralizers. Other Dearborn materials include cleaners, rust removers and VPI, the specially treated paper that gives off an invisible protective vapor.

Why not discuss this important matter with a Dearborn packaging engineer? He will gladly assist you in setting up a packaging procedure that fully meets government specifications . . . one that will assure the corrosion-free arrival of your products at their destination.

DEARBORN CHEMICAL COMPANY
Merchandise Mart Plaza • Chicago 54, Illinois

Dearborn
Reg. U. S. Pat. Off.

NO-OX-ID
IRON + = RUST

THE ORIGINAL RUST PREVENTIVE

This booklet will help you

The new edition of "Preventing Corrosion in Export Packaging" gives you: (1) current government specifications; (2) cleaning methods; (3) approved packaging methods; (4) how to apply rust preventives; (5) how to wrap, seal and dip parts; and (6) other valuable information with step-by-step picture stories. Write for it today.

Dearborn Chemical Company, Dept. S
Merchandise Mart Plaza, Chicago 54, Ill.

☐ Please send a copy of "Preventing Corrosion."

☐ Have a Dearborn Representative call.

Name.....

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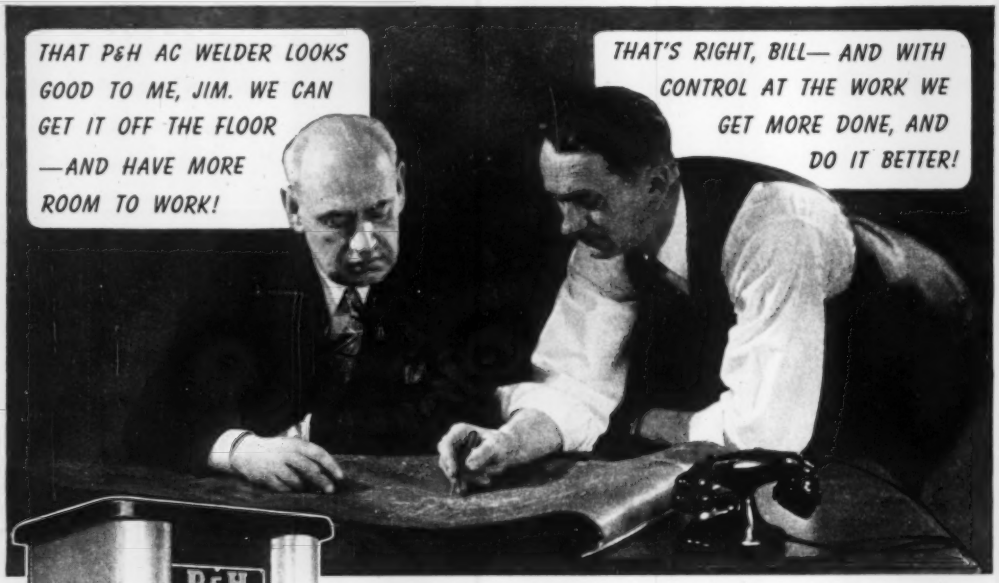
THAT P&H AC WELDER LOOKS GOOD TO ME, JIM. WE CAN GET IT OFF THE FLOOR —AND HAVE MORE ROOM TO WORK!
THAT'S RIGHT, BILL— AND WITH CONTROL AT THE WORK WE GET MORE DONE, AND DO IT BETTER!

Save floor space, cut welding time for more production at lower cost

. . . . use P&H AC Arc Welders with exclusive Dial-lectric remote control

Give yourself more room for your production needs. Mount your P&H Welder off the floor, out of the way.

Dial-lectric remote control lets you do this. Your operator can turn the heat on *at the work*. It also cuts down his "walking time" . . . turns it into *welding* time for increased output.

Besides saving space P&H Dial-lectric control eliminates cores, coils, sprockets, gears and other moving parts that cause excessive maintenance and downtime.

P&H AC Welders are available in a full range of sizes up to 625 amps. See your P&H representative or distributor for full details on how this outstanding welder can save you time and money.

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WELDING DIVISION
4411 W. National Avenue
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HARNISCHFEGER
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Excavators • Overhead Cranes • Hoists • Arc Welders and Electrodes • Soil Stabilizer • Crawler and Truck Cranes • Diesel Engines • Cane Loaders • Pre-assembled Houses

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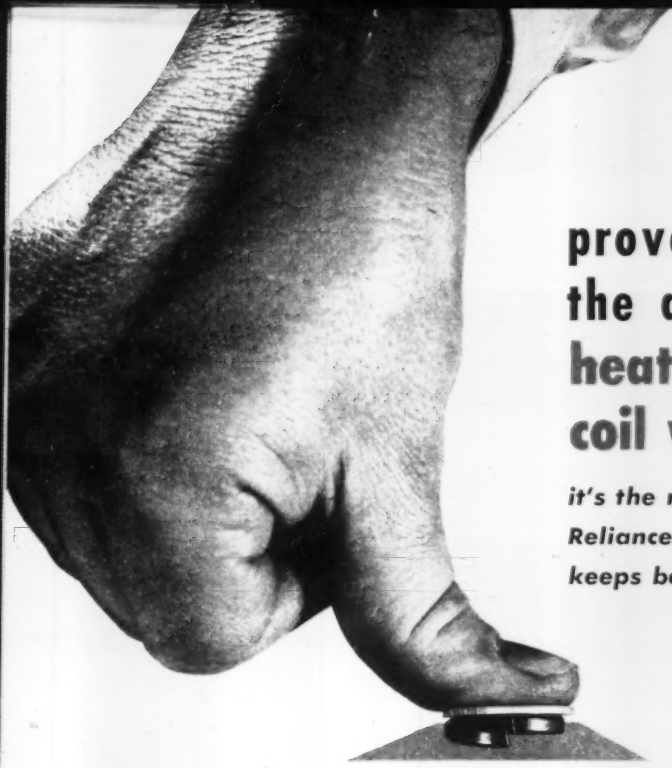
Specialized Training
Metal Welding Fabrication
1 week to 18 months
Harnischfeger Welding Training School
in conjunction with
Milwaukee School of Engineering
Write to P & H today for further details
HARNISCHFEGER CORPORATION
Welding Division
4411 WEST NATIONAL AVENUE
MILWAUKEE 14, WISCONSIN



prove to yourself the advantages of a heat treated helical coil washer...

it's the natural mechanical action of Reliance Spring Lock Washers that keeps bolted assemblies .....

TIGHTER LONGER

Faster Assemblies, too

You can have Reliance Spring Lock Washers of the correct type and size, pre-assembled on the bolts or screws you use, saving the time required to assemble them. They're called Eaton Springtites. Write for bulletin S-49.

Strong Shoulders in Seconds

Reliance Snap Rings fit into shallow grooves in shafts or bores, forming strong, long-wearing external or internal shoulders without extensive, costly machining or waste of metal. Write for bulletin.

- lay a Reliance Spring Lock Washer on a hard surface and try to flatten it.
- when that lock washer is compressed to flatness in a bolted assembly, the powerful reactive force—developed through carefully-controlled heat treatment—which resists your flattening attempt exerts constant pressure under the nut or bolt head to keep the assembly tight.
- when parts become worn or the nut is backed off, the lock washer continues to function until it regains its original form.
- no other fastening device packs such powerful, highly-concentrated reactive force in such compact form. This pressure is exerted on all engaged threads, *not concentrated on one.*
- no other fastening device has such a wide reactive range.
- no other fastening device provides the dependable, enduring bolt tightness you get by using Reliance Spring Lock Washers.
- keep this test in mind when you specify or order fastening devices.

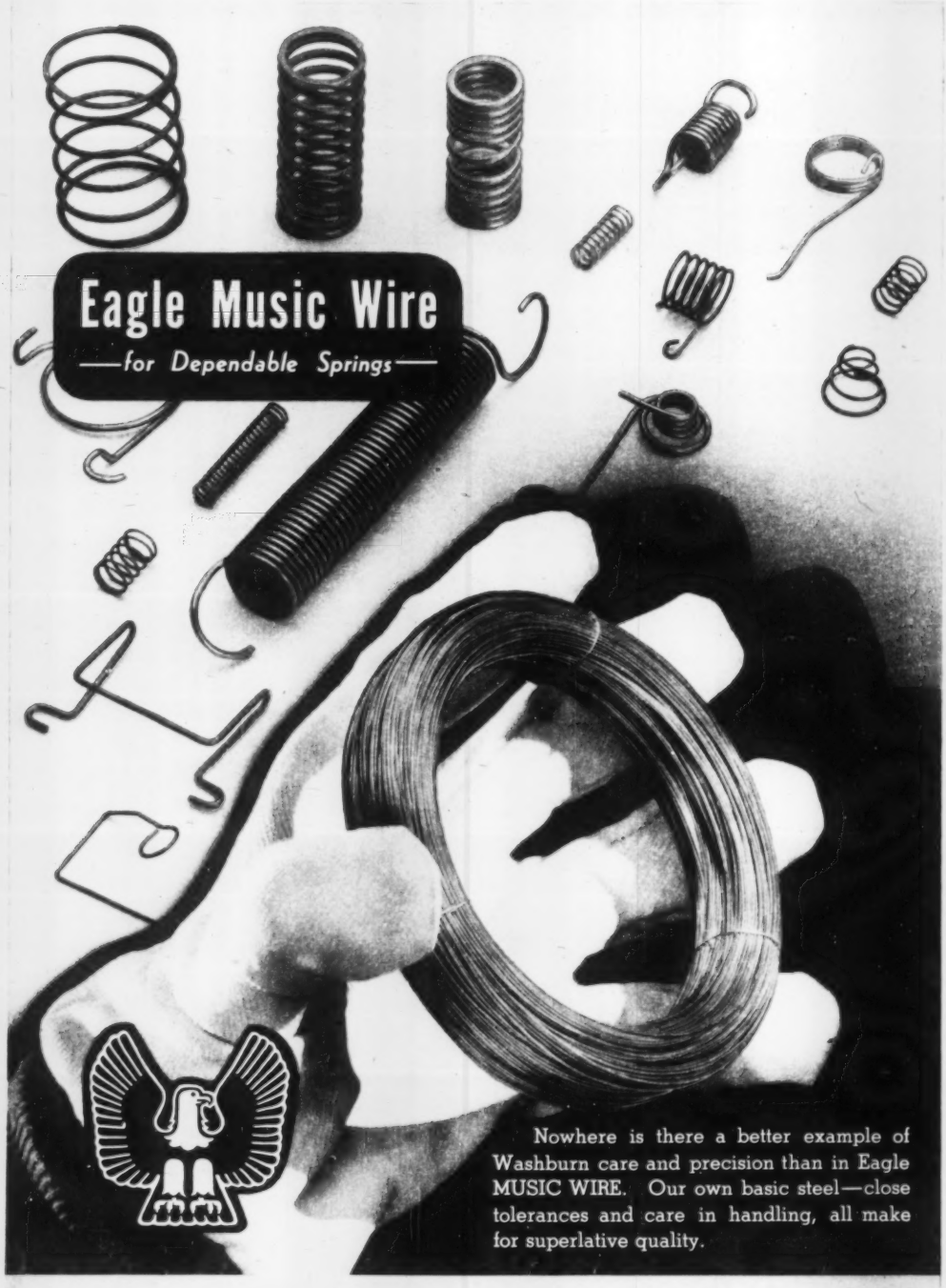
EATON

EATON MANUFACTURING COMPANY

RELIANCE *Spring* LOCK WASHERS

RELIANCE DIVISION, MASSILLON, OHIO

Sales Offices: New York, Cleveland, Detroit, Chicago, St. Louis, San Francisco, Montreal
In Canada: Eaton Automotive Products, Ltd., London, Ontario.


Eagle Music Wire
—for Dependable Springs—
Nowhere is there a better example of Washburn care and precision than in Eagle MUSIC WIRE. Our own basic steel—close tolerances and care in handling, all make for superlative quality.

WASHBURN WIRE CO., New York City

On Tap—Tooling for Tough Government Orders

There's scarcely a mass production threaded part on government contract lists for which we haven't worked out standardized Vers-o-tool procedures that guarantee high precision, top output and lower threading costs.

- **Vers-o-tools are simply designed, with fewer parts than any other self-opening die; they are hardened and ground throughout—high precision tools.**
- **These Vers-o-tools *with ground-thread-form circular chasers* produce smoother threads consistently. The Namco micrometer gage quick-checking of thread form before and after each chaser grind insures thread uniformity, saves time, eliminates scrap.**
- **Vers-o-tool circular chasers last longer—*as much as 50 times longer.* They're regrindable through a full 270° of circumference. Chasers and holding blocks are also interchangeable, size for size, between revolving and nonrevolving styles of Vers-o-tools. Chaser inventories are kept at minimum.**

We're ready to help you—right *now*—with the right answers to your critical threading problems. New catalog—D-51.

JOB FACTS

PART —$1\frac{1}{2}$"diam. forged brass coupling.

THREAD —6 pitch American National Hose with "Higbee" thread at start, to eliminate partial threads, make quick connections.

MACHINE —Goss & DeLeeuw Chucker.

DIE HEAD —$5\frac{1}{2}$"style DR Vers-O-Tool, with 5 combination ground thread and turning chasers to give "Higbee" start.

PIECES —2000 per grind, or better, with Namco Ground Thread Circular Chasers.

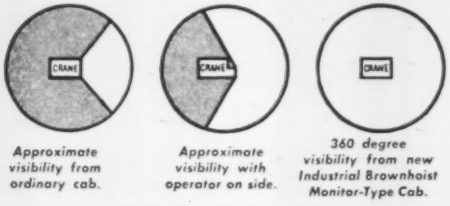
NC & NF, taper and straight American Briggs and dry seal chasers usually are shipped from ready stocks.

The NATIONAL ACME CO.

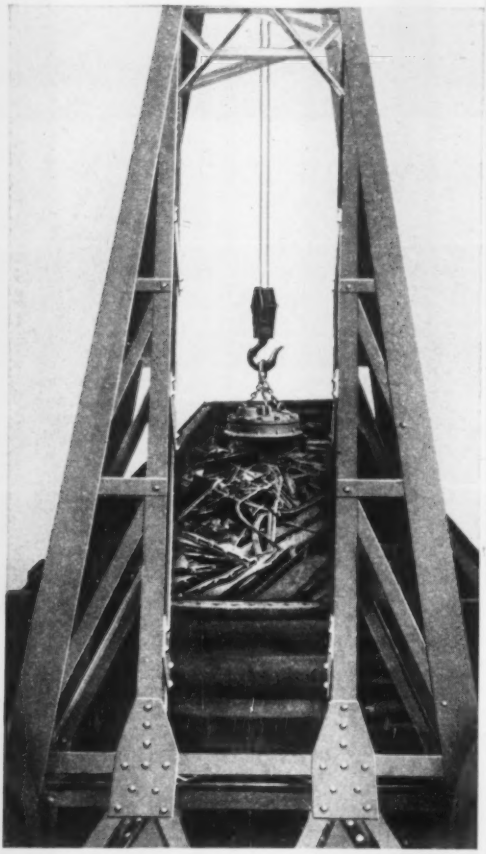
170 EAST 131st STREET • CLEVELAND 8, OHIO

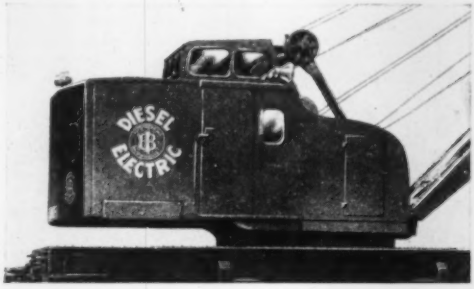
Acme-Gridley Bar and Chucking Automatics: 1-4-6 and 8 Spindle • Hydraulic Thread Rolling Machines • Automatic Threading Dies and Taps • The Chronolog-Limit, Motor Starter and Control Station Switches • Solenoids Centrifuges • Contract Manufacturing

BROWNHOIST – THE ONLY LOCOMOTIVE-CRANE CAB THAT PROVIDES A CLEAR VIEW IN EVERY DIRECTION



Approximate visibility from ordinary cab. *Approximate visibility with operator on side.* *360 degree visibility from new Industrial Brownhoist Monitor-Type Cab.*





Mounted high in the crane and surrounded by large windows, the operator in a Brownhoist patented Monitor-Type cab has full 360° visibility – forward, backward, and to both sides – providing safer operation, faster, more efficient loading and unloading. In addition the new Clear-Vision Boom is another Brownhoist feature that permits the operator an unobstructed view of his work. When unloading from high-walled railroad cars he can see right into the car.

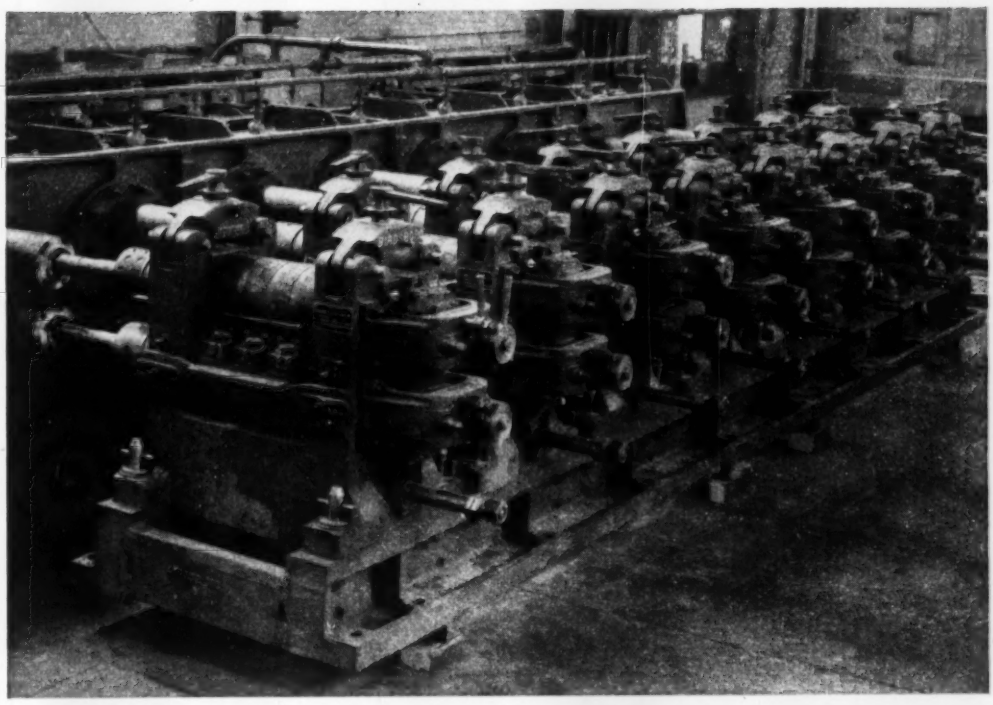
The Monitor-Type cab is also designed for the safety and comfort of the operator. All controls are conveniently located and can be easily reached from a comfortable, well-raised seat. There's a soundproof partition between the operator and the machinery. There are doors on both sides of the cab and there's a 14" safety clearance between car body and rotating upperworks.

Brownhoist Diesel and Diesel Electric Locomotive-Cranes are available in capacities from 20 tons up for speeding materials handling with magnet, hook or bucket. Write today for complete information.

BROWNHOIST BUILDS BETTER CRANES

INDUSTRIAL BROWNHOIST CORPORATION, BAY CITY, MICHIGAN

DISTRICT OFFICES: New York, Philadelphia, Cleveland, San Francisco, Chicago, Canadian Brownhoist Ltd., Montreal, Quebec. **AGENCIES:** Detroit, Birmingham, Houston, Los Angeles. 148



MODERNIZE YOUR ROD MILL

for Increased Production... Lower Costs

Birdsboro's advanced engineering developed a new high speed finishing train, coilers and conveyors to modernize an existing mill. The eight stand finishing train is shown above at shop assembly.

If your production is lagging — or you find operating and maintenance costs are top heavy, call on Birdsboro. We are well equipped and have the engineering skill to modernize existing equipment—or replace it with the most up-to-date, efficient steel mill machinery.

BIRDSBORO

STEEL FOUNDRY & MACHINE CO.

Birdsboro, Penna.

Offices in Birdsboro, Pa. *and* Pittsburgh, Pa.

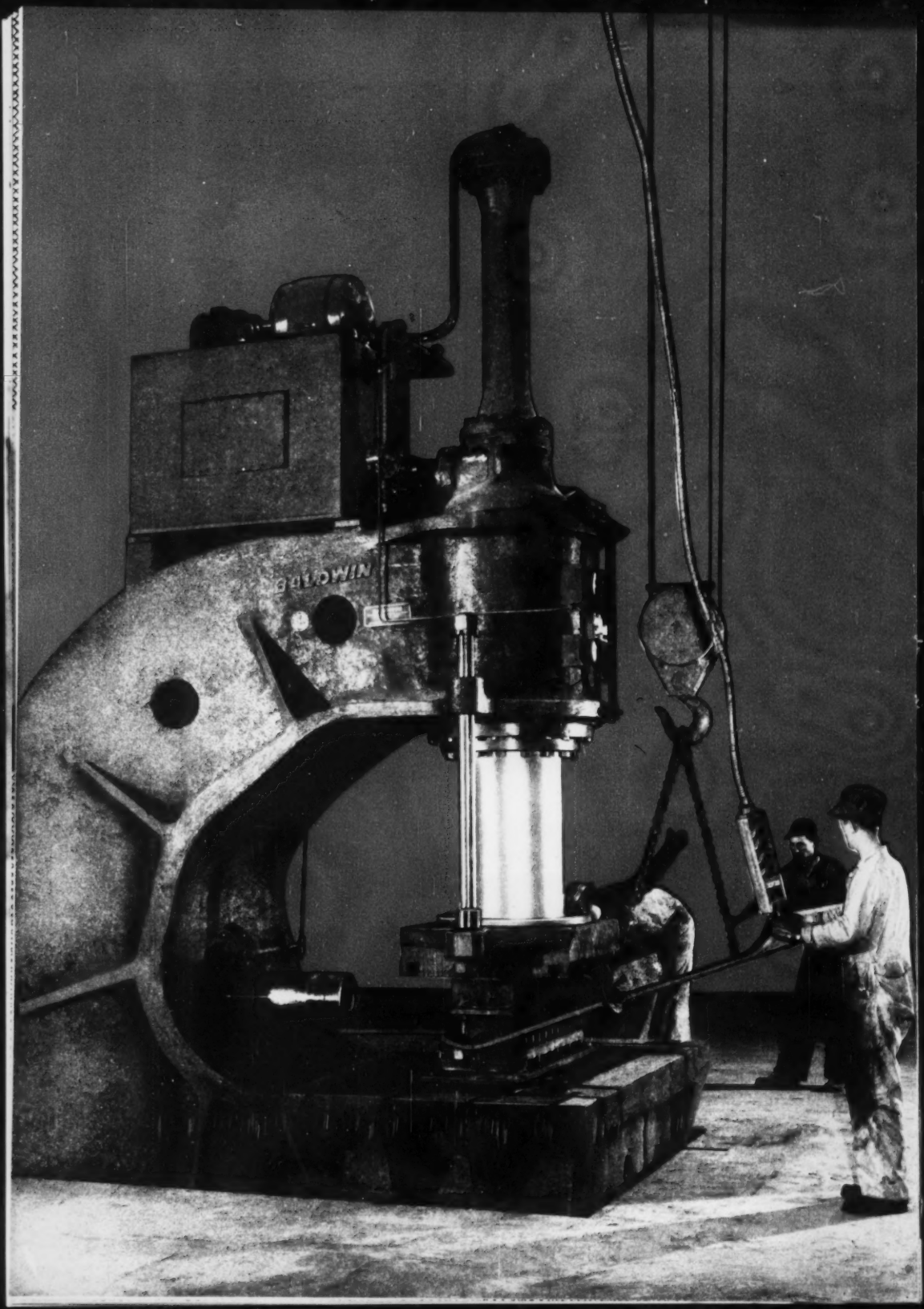
STEEL MILL MACHINERY

Designers and Builders of:

Steel Mill Machinery • Crushing Machinery • Rolls

Hydraulic Presses • Special Machinery • Steel Castings

MM 21-51


BALDWIN

THIS BALDWIN PRESS

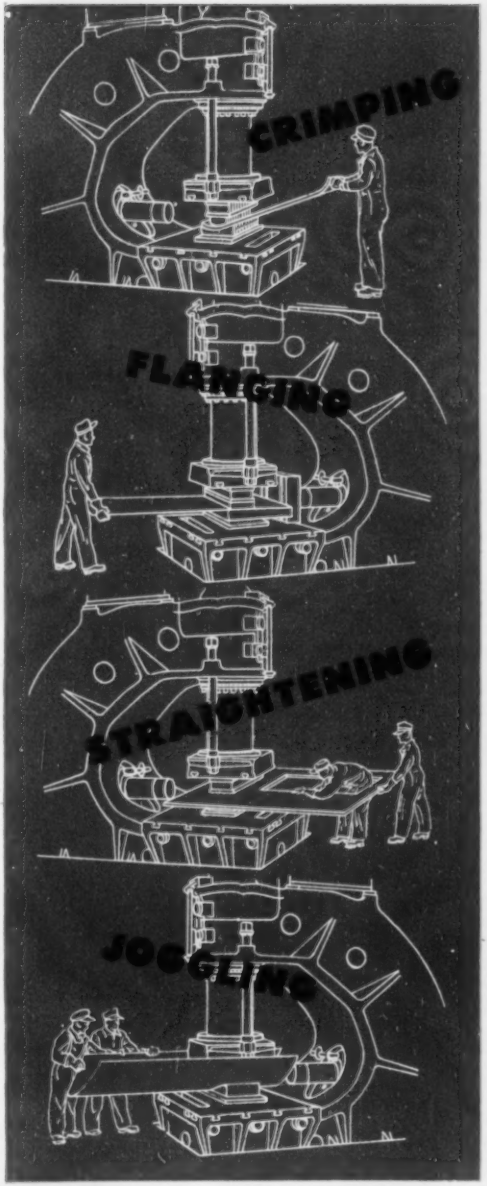
does many jobs well

This Baldwin 400-ton gap type press will quickly earn the blue ribbon as the most versatile, profitable and helpful piece of equipment in your shop. It handles crimping, flanging, straightening and joggling operations rapidly and precisely, helps to expedite the flow of orders and produces at a rate that spells better profits.

Baldwin's Hy-speed Hydraulic System adds a big plus to the performance of every Baldwin press. The speed of the ram in every portion of the stroke, as well as the length of "dwell," is under continuous and complete operator control. An important refinement is found in the packing, which automatically adjusts itself to the pressure to which cylinder and ram are subjected. Re-packing can be done from the outside, without any necessity for major dismantling. The safety of the operator is given top consideration, with automatic stoppage of the slide in case of power failure—complete auxiliary manual control even in the cases of semi-automatic or automatic operation . . . and instant stoppage in case of emergency, and return of ram to top position.

Details are given in Bulletin 285, sent on request. A representative will be glad to consult with you, and work out the type of press best suited to your needs.

BALDWIN-LIMA-HAMILTON CORPORATION
Philadelphia 42, Pa.
Offices in Principal Cities



BALDWIN BLH LIMA-HAMILTON

BALDWIN-LIMA-HAMILTON
HYDRAULIC PRESSES

26 MILLION TONS of steel scrap "ain't hay"

IT took 57,000 tons of steel to build the Empire State Building in New York. That's about one-tenth of one percent of the tonnage of scrap required to produce the new steel demanded for America's defense and civilian needs this year.

Half of this scrap is produced by the steel mills themselves. The other half - approximately 26 million tons - must be supplied by the public. That tremendous tonnage is the equivalent of 461 Empire State Buildings - over 1400 carloads of scrap every day of the year.

Right now there is a scrap shortage. It threatens to interfere with steel production. So we appeal to you, as a user of steel and steel products, to do all you can personally to help collect scrap.

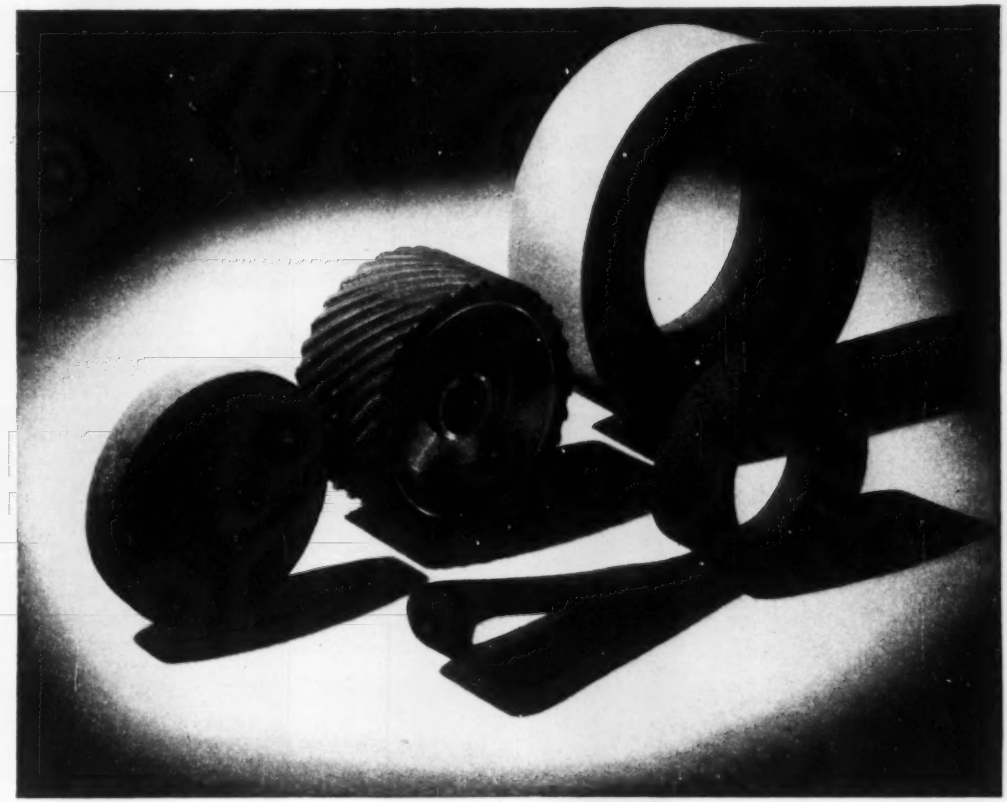
Somewhere in your place of business - and even at home - there are things that can be scrapped - worn-out or obsolete machines, pipe, boilers, tools, structural parts, etc., that you'll never use again in their present form. Turn them in through regular channels. Call the nearest dealer and start your scrap on its way to the steel mills - to help America reach its production goal of 105 million tons of new steel in 1951. It is this team-work that will help us win the victory again.

YOUR SCRAP YOUNGSTOWN IS NEEDED

The Youngstown Sheet and Tube Company

General Offices--Youngstown 1, Ohio
Export Offices--500 Fifth Avenue, New York
MANUFACTURERS OF CARBON ALLOY AND YOLOY STEELS

The steel industry is using all its resources to produce more steel, but it needs your help and needs it now. Turn in your scrap, through your regular sources, at the earliest possible moment.



Impartial advice . . .

That's what you get when you call your CARBORUNDUM representative for information on abrasives. He's a specialist who can recommend from a *complete* abrasive line. If you're using a belt where a wheel would do the job better, he will tell you so since he sells a *complete* line of abrasive products.

Furthermore, he is posted on all new methods and improvements throughout the entire field of abrasives—a specially important factor to you if your production requirements change frequently. For instance, he'll bring you improved products such as CARBORUNDUM's "61" Contact Wheel (illustrated above), with the "milling cutter" design that raises the practicability of belt grinding to new levels.

For real results in all abrasive applications, see your CARBORUNDUM representative. See him soon . . . and often.

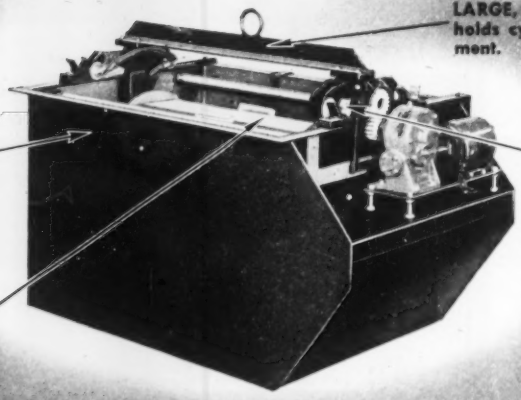
Only CARBORUNDUM

TRADE MARK

makes ALL Abrasive Products . . . to give you the proper ONE

"Carborundum" is a registered trademark which indicates manufacture by The Carborundum Company, Niagara Falls, N.Y.

ONLY Udylite PLATING BARRELS GIVE YOU ALL THIS . . .


LARGE, STEEL bridge member holds cylinder in rigid alignment.
HEAVY CAST-BRASS Contact Saddles, machined for perfect contact with cathode horns.
DOUBLE-WELDED (leak-proof) TANK—Large enough to accommodate heating or cooling coils as required.
DEEP-DIP DESIGN—Allows cylinder to hang deep in tank.

and Savings, too!

No other plating barrel can match the Udylite Barrel in QUALITY, EFFICIENCY and DURABILITY. Udylite Barrels plate the work—not the cylinder. Electrical insulation is arranged so that ALL the current flows directly to the work pieces. Cathode leads are encased in unbroken insulation . . . panels cannot absorb solution . . . there is no possibility of any element of a Udylite Barrel diverting current from the work being processed.

This not only results in faster, more uniform plating but also gives a substantial savings in current consumption.

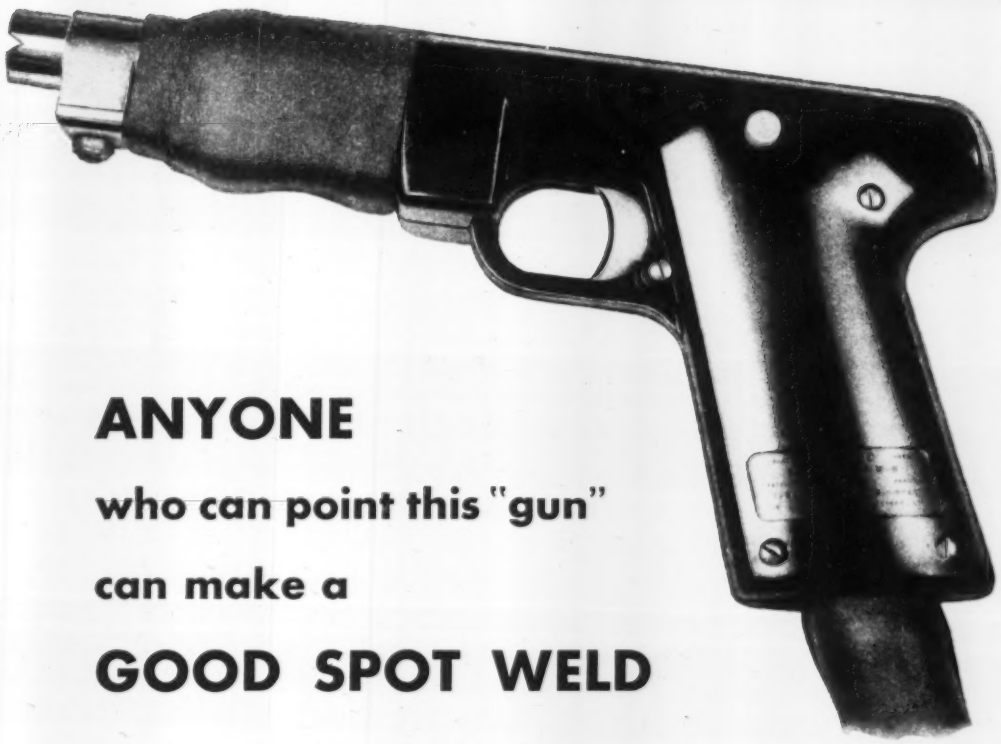
On the basis of actual service records, the Udylite Plating Barrel lasts longer and produces more work with lower operating and maintenance costs than any barrel built! Ask your Udylite Technical Man about it. Or write *The Udylite Corporation, Detroit 11, Michigan*, for full details. There's no obligation.

Visit our exhibit at the 33rd National Metal Exposition and Congress at Michigan State Fair Grounds, Detroit, October 15-19, Booths 235-330-342 in Building "D".

PIONEER OF A BETTER WAY IN PLATING

THE UDYLITE 'LUCITE' PLATING CYLINDER
6 WAYS BETTER
1 Greater abrasion resistance
2 30% more perforated area
3 "Deep-Dip" Design
4 Stronger construction
5 Lower initial cost
6 Operates through entire cycle (acid or alkaline)

THE Udylite CORPORATION
DETROIT 11, MICHIGAN



ANYONE

who can point this "gun"

can make a

GOOD SPOT WELD

"HELIARC" HW-8 Pistol-Grip Torch needs no forging pressure...works from one side of sheet...spot welds both STAINLESS and CARBON STEELS

Are you using light gage metals to fabricate large assemblies or irregular shapes? If so, chances are you can simplify many of your joining problems, boost production, and cut costs, too, by spot welding with the HELIARC HW-8 Torch.

The HW-8 joins mild steel, low alloy, or stainless steel .020 to .064 in. thick at one to two seconds per weld. Because it works *from one side of the sheet*, without forging pressure, it makes an easy, one-hand job of spot welding — even in places where resistance welding is not practical or possible.

Connected to a suitable power source with auxiliary timer, the HELIARC Spot Welding Torch makes inert gas shielded welds without fumes, smoke, or spatter. Since operation is automatically controlled, workmen on the assembly line need only press the "muzzle" of the "gun" against the work and pull the trigger. A single hose assembly permits free use of the torch over a 25-ft. radius.

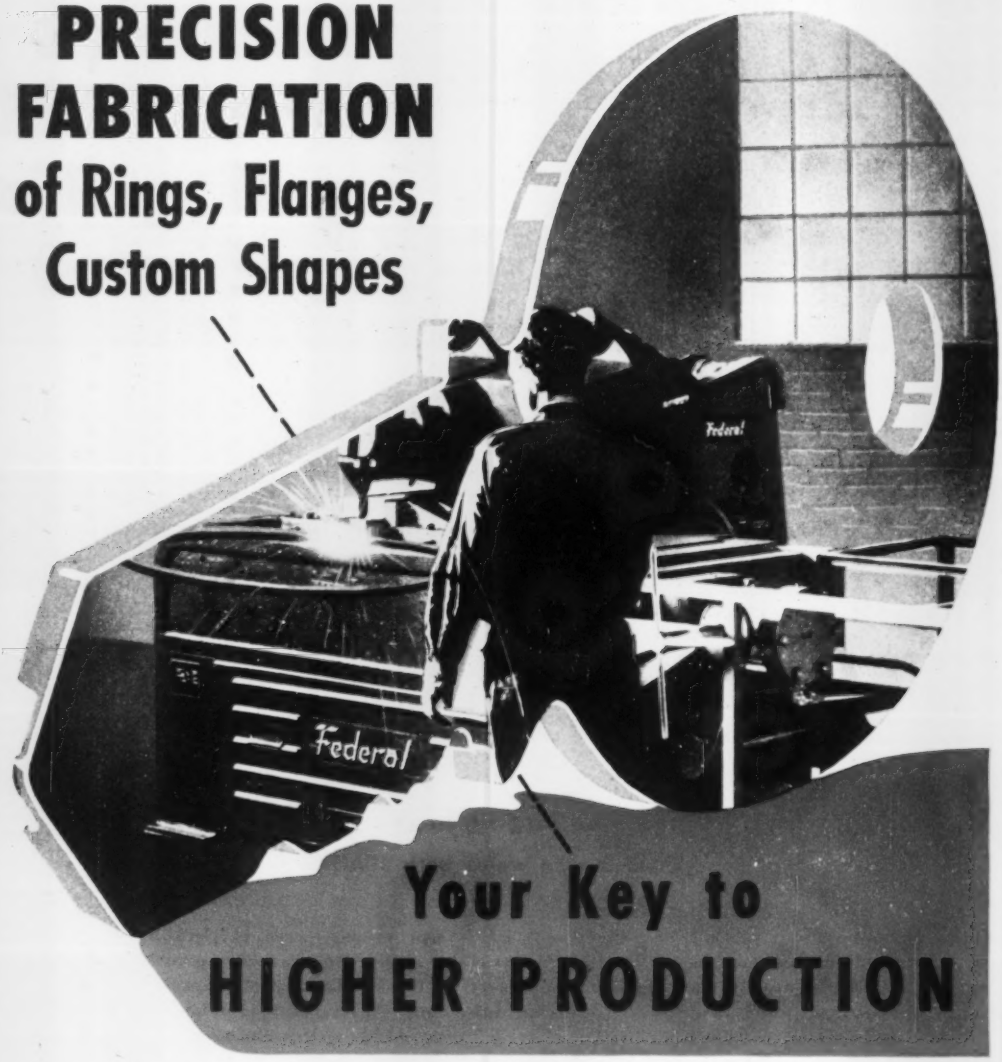
For further information, telephone or write today. LINDE AIR PRODUCTS COMPANY, a Division of Union Carbide and Carbon Corporation, 30 East 42nd Street, New York 17, N. Y.

The term "Heliarc" is a registered trade-mark of Union Carbide and Carbon Corporation.

Linde Trade-Mark

Products and Processes for MAKING, CUTTING, JOINING, TREATING, and FORMING METALS

PRECISION FABRICATION of Rings, Flanges, Custom Shapes



Your Key to HIGHER PRODUCTION

King bends and welds to close tolerance the rings, flanges, custom shapes which are components of many diversified products of American Industry.

King's long experience (since 1904), competent personnel, new, capable equipment combine to create *your* key to higher production . . . more efficient production . . . *on time* production.

For a list of facilities, abilities and a capacity chart . . . or for a complete catalog . . . phone, wire or write Department SS51.

King FIFTH WHEEL COMPANY
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℞

"Just what the doctor ordered" . . . in BRASS . . .

is being "put up" here at the scales, in scrap and other metals, before going to the furnaces for melting. And you (the "doctor") can always depend on getting your prescription filled *and refilled* with conscientious correctness . . . for Bristol Brass sheet, rod and wire. The Bristol Brass Corporation, since 1850 in Bristol, Conn. Offices or warehouses in Boston, Chicago, Cleveland, Dayton, Detroit, Los Angeles, Milwaukee, New York, Philadelphia, Pittsburgh, Providence, Rochester.

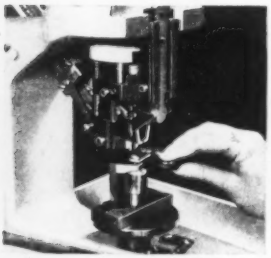
"Bristol-Fashion" means Brass at its Best

How to add
more speed
to the faster
fastening method

AUTOMATIC DRIVING

of P-K Self-tapping Screws

This automatic, double spindle, hopper-fed machine is being used for driving two P-K Type U Hardened Metallic Drive Screws simultaneously in a plastic wiring device.



This is an automatic, single spindle, hopper-fed machine (one of several types) for high speed driving of P-K Screws, with slotted, Phillips, or hex heads. It also can be supplied with two or more spindles for multiple operations.

To meet America's colossal production requirements . . . for defense, for civilian goods . . . even more speed is needed in operations that have already set time-saving records.

Fitting right into this urgent need for *more speed, more efficiency*—in assembly operations—is the ever-wider use of Automatic Driving devices with P-K Screws.

A wide range of Automatic Driving equipment is available for use with the various types of P-K fasteners—and with slotted, Phillips recessed, and hex head styles. It runs from portable electric drivers, through connected air and cable types, to hopper-fed automatic screw-driving machines. And all have this in common—a substantial reduction in assembly time and cost.

Parker-Kalon does not manufacture power-driving equipment, but has tested many devices in the P-K laboratory under production line conditions, and found them suitable for use with P-K Screws. Some are illustrated here.

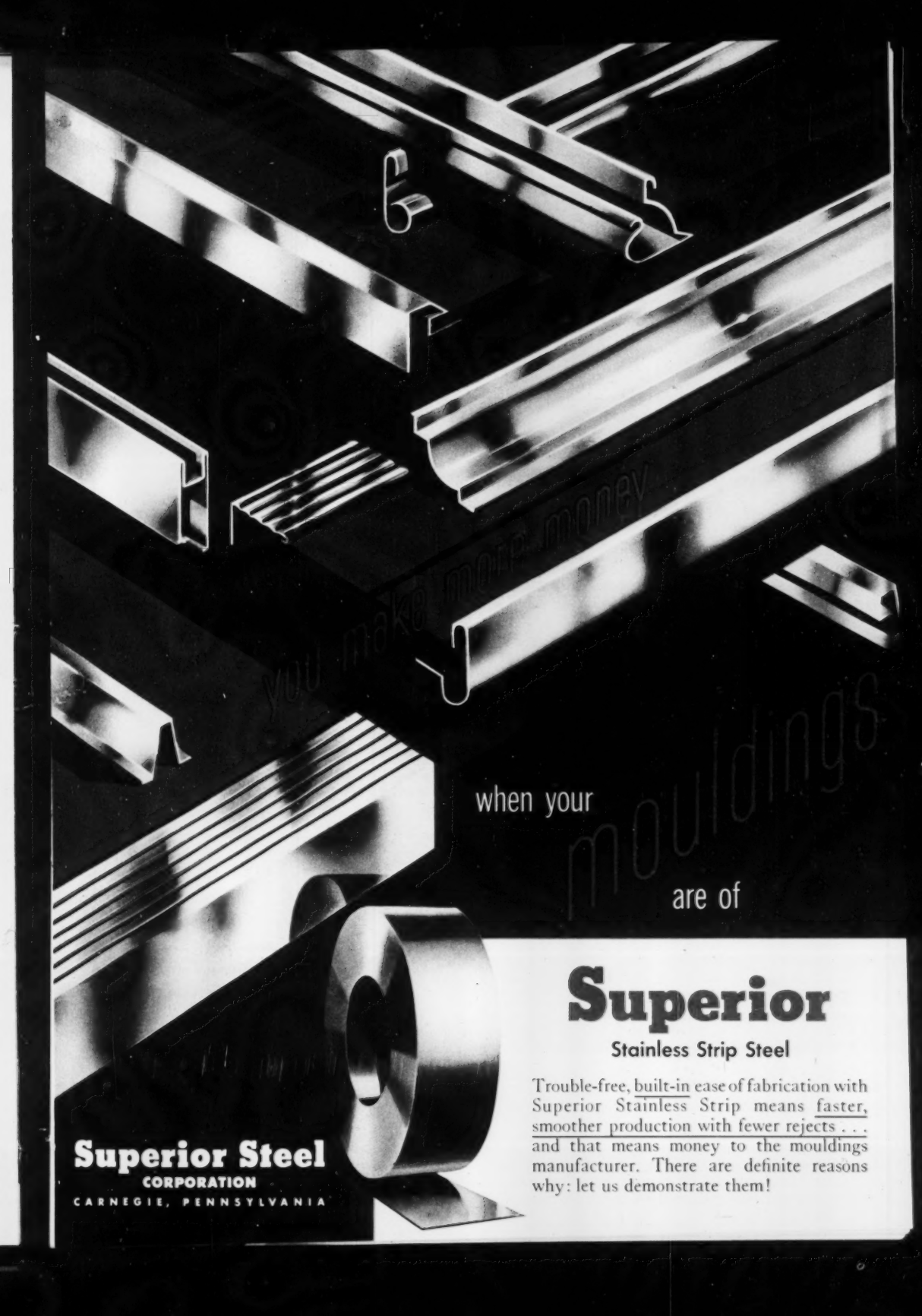
For special information on power-driving equipment, talk to a P-K Assembly Engineer. Or, write to Parker-Kalon Corporation, 200 Varick St., New York 14.

IF IT'S P-K IT'S O.K.

The Original

PARKER-KALON® SELF-TAPPING SCREWS

A TYPE AND SIZE FOR EVERY METAL AND PLASTIC ASSEMBLY



Superior

Stainless Strip Steel

Trouble-free, built-in ease of fabrication with Superior Stainless Strip means faster, smoother production with fewer rejects . . . and that means money to the mouldings manufacturer. There are definite reasons why: let us demonstrate them!

Superior Steel
CORPORATION
CARNEGIE, PENNSYLVANIA

Shaking the bugs out of a new screening idea

When Southwestern Engineering Company, of Los Angeles, came up with the idea of a screen separator with "bumps *and* grinds"—bouncing *and* vibrating action—they knew they had something.

Something that might speed up sluggish separating processes tremendously. In oil, for example, where the "sluggard" is mud... in fruit processing where it's pectin, juices and purees... in ceramics where it's a silica-clay-talc-water slurry called "slip."

The idea was swell. But working it out, finding the right metal for the cylinders, was a lulu.

They'd try one. It wouldn't meet the acid test ...quite. And would contaminate some products ever so slightly, but ever so disastrously.

They'd try another. Tons of jiggling mix would eventually break its back.

Still another. The cylinders would keep splitting at the seams.

Finally, they tried Monel. And they were in. No more trouble, no matter how much machines were overloaded or over-speeded!

First to take advantage of this new Sweco development was Gladding McBean & Co.

They installed the two Sweco separators shown here to screen clay slip for their famous "Hermosa" wall and floor tile. And by so doing, they improved their product because they were able to use a finer clay . . . boosted production because they could handle slip with only 40% instead of 51% water (thereby saving about 35% on fuel costs in the subsequent drying)...and increased the life of the screen cloth from *4 days to 26 months!*

Now what about your metal problem?

Could one or another of the Inco Nickel alloys help solve it? Very possibly. Write us about it. Even though Nickel is being diverted to defense, we are ready right now to help you with ideas and suggestions for your present production and future planning.

The International Nickel Company, Inc.
67 Wall Street, New York 5, N. Y.

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NICKEL (INCO) ALLOYS

MONEL® • "R"® MONEL • "K"® MONEL • "KR"® MONEL "S"® MONEL • NICKEL • LOW CARBON NICKEL DURANICKEL® • INCONEL® • INCONEL "X"®

STEEL

The Metalworking Outlook

September 24, 1951

Needed: More Sulphur

Watch for new restrictions on inventories and uses of sulphur, knottiest supply problem in the chemical industries. Domestic and export demand for sulphur in the fourth quarter will exceed production by 100,000 tons. It is essential in the production of steel, explosives, rubber, gasoline and chemicals. United States produces about 90 per cent of the world output, must help supply friendly nations overseas. Some 45 projects are getting underway here and abroad to increase production.

Coal Aplenty

Comforting is the assurance by Bituminous Coal Institute that 95 per cent of America's coal reserves are still under ground. So vast are the reserves that they can be called upon to do many jobs now filled by petroleum and natural gas. But immediate coal needs are increasing. Friendly European nations are clamoring for more coal than is being shipped and foreign trade officials are looking for means to fill this demand. Domestic coking requirements are going up: A record 56½ million tons went into coking ovens during the first six months this year.

Britain Needs Scrap

Scrap shortage is just as acute in Britain as it is here—maybe more so. During the last war practically everything with iron content was ripped up for melting. Fences, statues, door knockers, chains and other decorative architecture all paid the price and have not generally been replaced, so domestic collections are out of the picture. Attention is being focussed on sunken marine scrap, of which there is plenty around the British Isles. Cost of reclamation will be a big factor.

More Steel for Warehouses

Good news for small buyers of steel: Warehouse quotas will likely be raised to substantially above 100 per cent of base allotment. Pressure is being applied now to boost warehouse allotments to match the increase in steel ingot capacity.

Report on Machinability

Two years of machinability testing on plain carbon and alloy steels, in which tons of steel were reduced to chips, are compacted into the second Air Force machinability report. Five manufacturers and research organizations participated. Volume 2 comes just about a year after the first report and limited distribution is being made by the publisher, Curtiss-Wright Corp. The 196-page compilation is studded with striking illustrations and charts relating tool life to cutting speeds for 12 different steels in varying heat treated conditions

Production-Engineering News—p. 93 The Market Outlook—p. 143

and using both high-speed and carbide cutting tools. Included is a section covering the machining of titanium, for which 14 organizations supplied data.

Machine Tool Unification

The armed services are finally teaming up to lick the machine tool problem. Munitions Board has set up a central inventory to record government-owned production equipment held by the three services. Any machine tool not in use can be drawn out to fill production needs. C. E. MacArthur has been brought into the Munitions Board from the machine tool industry to take charge of the inventory.

Specs on Primer

Approval has been given to a rust-inhibiting primer for ammunition components. It's a quick-drying cellulose nitrate companion to the one-coat hot lacquer finish given military specifications (STEEL, Sept. 10, p. 54). Suitable as a prime coat under lacquer and enamels by spray or dip application, it has military specification MIL-F-11414 (Ord).

Generating Equipment Wanted

Electric power men are making a fuss over expansion slowdowns in their industry. They foresee a need for twice as much generating equipment in the next 15 years as they now have. Swelling industrial, farm and home use of electricity should balloon an already huge metalworking market.

Straws in the Wind

Wallace B. Quail, Armco Steel Corp., is new director of NPA's Iron & Steel Division, replacing Richard F. Sentner, who returns to U. S. Steel . . . The Air Force hopes to save $2½ million a year in contractors' discounts by opening disbursing offices close to industrial areas . . . Metal Products Division of Koppers Co. will put out a new type of continuous steel casting machine . . . The rivet industry—eight months behind in aircraft orders—is hounding NPA to double its fourth quarter allotment of 1.5 million pounds of aluminum . . . Hudson has a multi-million dollar order to make fuselage sections for Boeing's B-47 Stratojet.

Here and There in Industry

There's a good chance for a 3½ per cent wage increase come winter (p. 65) . . . "Sequential Seniority" is a term that Weirton Steel and the Independent Steelworkers Union use for guaranteed job-to-job routes up through the ranks (p. 66) . . . Ti-Loc: New one-coat enamel that uses non-premium steel (p. 67) . . . Shot and grit industry makes big impact from little pellets (p. 68) . . . Friction is fighting a losing battle with modern lubrication equipment (p. 69) . . . Pressure's on valve makers (p. 76).

HERESITE

REG. U. S. PAT. OFFICE

LININGS FOR TANK CARS AND TRAILER TANKS

RESISTANCE

Heresite linings effectively prevent product contamination of such items as concentrated Sulphuric Acid, Rubber Latex, Formaldehyde, Lactic Acid, Battery Acid, Acetic Acid, Vinegar, Fruit Juices, and Wine.

EASE OF CLEANING

Heresite lined tank cars are quickly cleaned by Steaming, Hot Water or any type of Solvent wash.

SYNTHETIC RUBBER LINING

The strongest caustic hydroxide solutions, as well as the halogen acids and other chemicals, may be transported in a HERECROL lined tank car or trailer tank.

LITERATURE WILL BE FURNISHED UPON REQUEST

HERESITE & CHEMICAL COMPANY

MANITOWOC, WISCONSIN

Dependable Dan

Turn Your Scrap In —Help Turn More Steel Out

Scrappy

The Bigger The Scrap Pile Now
The Bigger The Steel Production
Next Winter

DETROIT STEEL CORPORATION

PRODUCERS OF

Coke and Coal Chemicals • Pig Iron • Ingots
Slabs • Sheet Bars • Billets • Wire Rods
Manufacturers' Wire • Merchant Wire Products
Welded Fabric • Cold Rolled Strip Steel

GENERAL OFFICES
DETROIT 9, MICHIGAN

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COLD ROLLED STRIP STEEL and FLAT WIRE

Coils . . . Cut Lengths . . . All Tempers

SHEETS

COLD ROLLED . . . HOT ROLLED . . . H. R. PICKLED . . . LONG TERNE . . . GALVANIZED

Standard and Production Sizes or Cut to Actual Working Dimensions

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We're Courting Trouble

When the President of the United States assumes office, he takes oath that he will "preserve, protect and defend the Constitution of the United States." Every one of our 32 Presidents has taken this oath with utmost sincerity, thoroughly believing that nothing would cause him to swerve a hair's breadth from his high resolve.

Unfortunately history shows that some Presidents—consciously or unconsciously—break their solemn promises. In the process of constantly gaining confidence and power, they develop a complex that they possess superior acumen and judgment. They become irked by acts of the legislative and judicial branches which run counter to policies of the executive branch. In extreme cases, Presidents have attempted to make their personal opinions take precedence over decisions of the courts and intents of the laws.

We are witnessing such attempts now. Last May a United States Court of Appeals by unanimous decision ordered Secretary of Commerce Charles Sawyer to return the Dollar Steamship Line to its rightful owners within five days. President Truman ordered Secretary Sawyer to refuse to do what the court ordered on the ground that to do so "would seriously affect the public interest." By refusing to review the case on three occasions, the Supreme Court had in effect confirmed the finding of the lower court. Thus President Truman is trying to impose his stubborn will over the decisions of the highest court.

He also scoffs at laws. He uses the Taft-Hartley Act only when it serves his purpose. At other times he tries to ignore, ridicule or sabotage it. More recently he has been slow to carry out the intent of the Defense Production Act. It has been law for seven weeks, yet the Office of Price Stabilization has done nothing to put the provisions of the Capehart amendment into effect.

Our Constitution prescribes rules under which we operate our government. If we are foolish enough to abandon these rules and to permit the President to place his will ahead of the intent of our laws and the decisions of our courts, we are asking for dictatorship and would deserve it.

E. L. Shaner

EDITOR-IN-CHIEF

TRY STANDARDIZATION: Many industrialists, particularly those identified with establishments of small or medium size, have a feeling that standardization is something that may be desirable on an industry-wide basis or in companies having many plants. They look upon it as something too theoretical or of doubtful merit when it is applied to the operations of a single small plant.

If some of these doubters would look into the

subject more carefully they would find that standardization really will pay dividends in many places where it is not being employed. Under certain circumstances it has possibilities for reducing inventory and the cost of its control, for cutting needless complexity in engineering and design, for improving quality and for doing other things which contribute to lower costs and greater profits.

These benefits are attractive enough to warrant the re-examination of standardization by some companies which heretofore have brushed it aside as being too academic and impractical.

—p. 94

* * *

WAGE TREND UPWARD: On the basis of present momentum and of current indications it looks as if wages in mass production industries may be increased about 3½ per cent during the coming winter. One act which has contributed strongly to this likelihood was the approval of the Wage Stabilization Board's proposal to allow wages—whether covered by escalator clauses or not—to rise with the cost of living.

There are other factors, of course. One is that some employers as well as unions are pressing for wage increases. In some cases employers are forced to do it to protect their working force from raiding. By actual tabulation, 47 per cent of applications for wage increases have come from employers whose plants are not unionized.

The matter of wage rates has become more complicated by conditions peculiar to these times. The trend is definitely upward, with no leveling off in sight. —p. 65

* * *

EMPHASIS ON SAFETY: Manufacturers of industrial safety equipment expect that the volume of their business in 1951 will exceed that of 1950 by about 20 per cent. Industrial users of this equipment, which includes chiefly protective shoes, respirators, face shields, safety glasses, protective helmets, fireproof shirts and trousers, leggings, aprons, hoods and capes, should experience little difficulty in obtaining these articles in sufficient quantity to meet their needs. For one thing, industrial management and government officials alike have a keen appreciation of the importance of safety in the shop during periods of emergency. Top priorities are extended to safety equipment manufacturers.

This is fortunate on two counts. One is that there is a special need for more safety for a larger working force than existed in any previous emergency. Secondly, safety equipment has been improved appreciably in recent years and its intelligent use will be more effective. —p. 77

* * *

BRITAIN'S HEADACHES: A quick glance at problems confronting the metalworking industries in Great Britain shows that our English cousins are plagued with troubles quite similar to our own. Britain is clamoring for more ferrous scrap just as vigorously as we are in the United States. Her manpower problem probably is even more acute than ours. She has a shortage of machine tools for defense work. Next Dec. 3 full control of the distribution of carbon steel will be imposed. Since carbon steel accounts for 95 per cent of the steel used in Britain, this means practically total control.

These and other problems in Britain take on new interest to Americans, now that Prime Minister Attlee has called a general election for Oct. 25. A change in administration probably would not result in an immediate easing of British economy problems, but it would lead to important shifts in long-range policy, which could be constructive. —p. 75

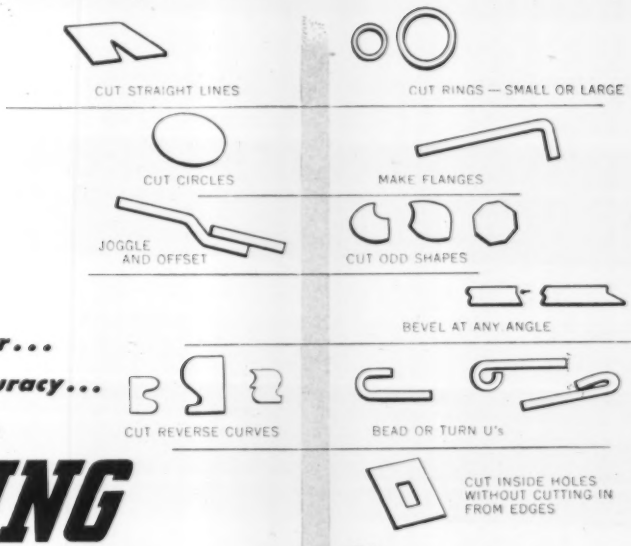
* * *

MACHINES ON PARADE: In this single issue one can pick at least three articles which reflect significant changes in the attitude of manufacturers toward the installation and use of machine tools. There was a time when management felt that a newly installed heavy machine, such as planer, milling machine or boring mill, would remain in the same place in the shop throughout its useful life. Today mobility is an accepted factor and many shops install new equipment with a feeling it may have to be shifted to new locations several times during its life.

Revolutionary changes in design and construction of jet-propelled airplanes are bringing into being many new machine tools of sizes, capacities and abilities hitherto unknown. Also, because of the time required to obtain a new machine, defense plants are doing wonders in "decocooning" stored old machines and adapting them to current machining requirements.

—pp. 80, 97, 98

if you do One or More of these Jobs...



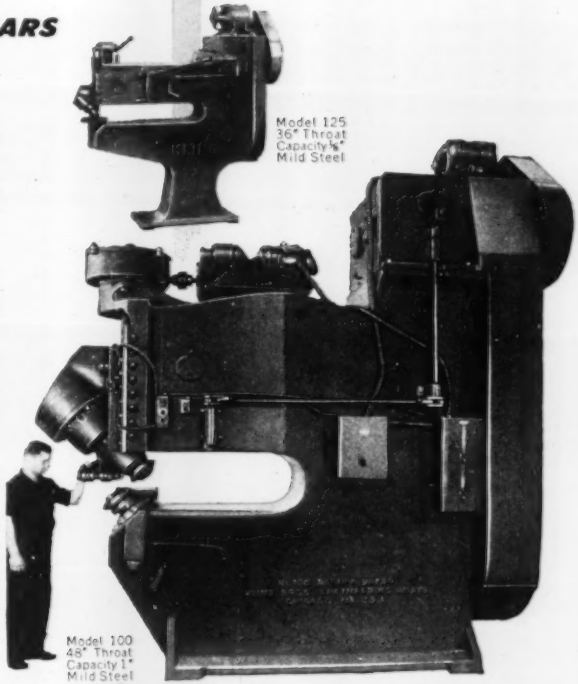
do them faster...

with more accuracy...

at a lower cost...

***with* KLING**

ROTARY SHEARS



Now get hair-line precision as well as speed in all of your sheet and plate cutting. With Kling Rotary Shears, no matter what your shearing requirements, you improve both speed and accuracy. You get accuracy unheard of before in shearing operations. You get speed that will keep pace with today's production demands.

You get this money-saving performance whether you do one or many of the operations shown above. One Kling Shear, because of its versatility, will often eliminate the need of several old style shears or other types of equipment.

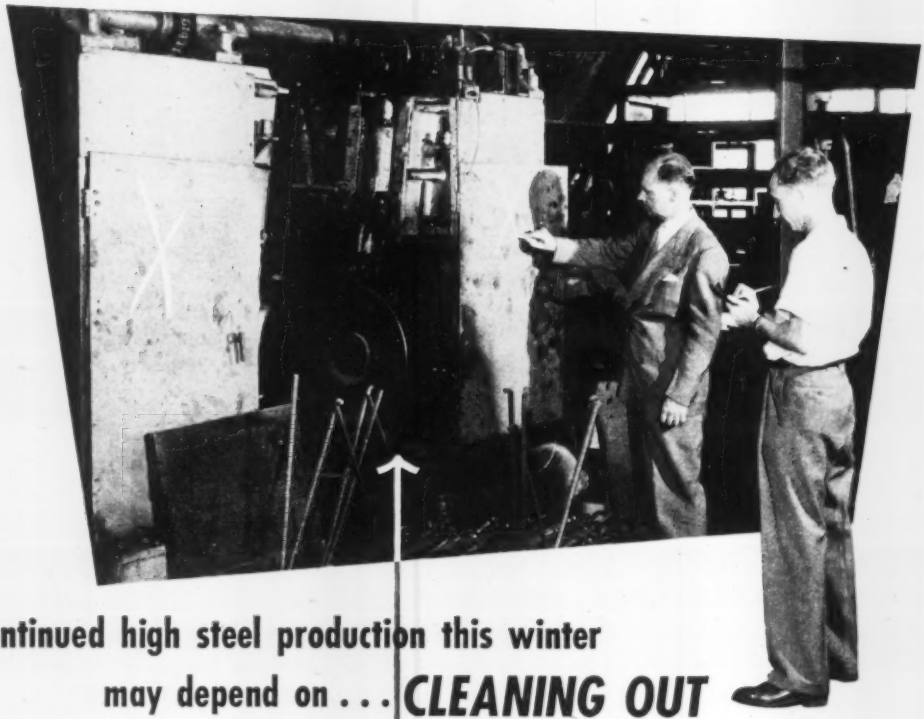
Many attachments are available which permit this machine to perform a wide variety of functions. With Kling Shears it is possible to shear almost any shape desired including parts with very small radii, to the right or left.

A wide range of types and sizes are available to meet your specific requirements up to a rated capacity to shear 1" thick mild steel.

get the facts... Find out how this machine will fit your production requirements and save you money. For complete details, instructions, features and specifications of all Kling Rotary Shears, write today for your free copy of Kling Bulletin No. 245A.

Kling Bros. Engineering Works,
1324 N. Kostner Avenue, Chicago 51, Illinois

Kling ***...an investment in speed!***



Continued high steel production this winter may depend on . . . CLEANING OUT YOUR SCRAP THIS MONTH

HOW TO TURN SCRAP INTO MONEY
with an organized dormant scrap round-up in your plant:

1. Appoint a top executive with authority to make decisions to head the salvage drive.
2. Organize a Salvage Committee and include a member from every department.
3. Survey and resurvey your plant for untapped sources of dormant scrap. Encourage your employees to look for miscellaneous scrap and report it to the committee.
4. Sell your entire organization on the need to scrap unusable material and equipment.
5. Prepare a complete inventory of idle material and equipment. Tag everything not in use.
6. Start it back to the steel mills by selling it to your regular scrap dealer.
7. **KEEP AT IT!**

***DORMANT SCRAP** is any obsolete, broken or worn-out and irreparable machinery, tools, equipment, dies, jigs or fixtures, etc., that may encumber your premises.

Despite . . . and because of . . . the continued high rate of steel production, the steel industry is on a hand-to-mouth basis in its receipts of purchased scrap . . . *essential to production!* Mills that normally inventory a 60 day supply of scrap, are now maintaining high production with less than a week's supply on hand. *That the effect of winter on transport facilities could quickly exhaust these dangerously meager scrap inventories . . . and thus force a cut in steel production . . . is obvious.* Help assure an uninterrupted steel supply by rounding up and selling your dormant scrap* to your regular scrap dealer *this month!*

INLAND

INLAND STEEL COMPANY

38 South Dearborn Street • Chicago 3, Illinois

Get Set for Another Wage Round

Mass production industries are in a good position to get a 3½ per cent wage increase this winter. WSB says it's not responsible for the inflationary whirl

THAT COMPLICATED GAME of tag that wages and prices play in the economy is about due to make industry "it" again.

Look to see mass production industries tagged this winter for an additional 3½ per cent wage increase. Organized labor will do the tagging. Its wage drives have gained momentum since the "wage freeze" of last January. The freeze was to hold wages to 10 per cent above January, 1950, levels. But first came exceptions made for escalator-clause agreements. Then, last month, came approval by the Economic Stabilization Agency of increases to organizations without cost of living agreements.

Net Effect—The wage ceiling was raised about 2 per cent commensurate with the percentage rise in the cost of living. More rises are to be expected; some administration spokesmen expect as much as an 8 per cent rise by next year.

The 8-cent-an-hour increase for copper smelters of the United Steelworkers of America-CIO ten days ago may be the formula that the same union will seek to have applied to other segments of metalworking. The increase was proposed by the Wage Stabilization Board. But WSB's proposal came after a month-long strike at Garfield, Utah, that had cut deeply into the nation's number one scarce metal.

Who Lights the Fuse?—Actually, wage board members are getting fed up with charges that they are lighting the inflationary fuse by ordering wage increases. No such thing, they say; they haven't ordered a single wage increase. WSB acts only to approve or disapprove wage increases that have been agreed to by employers and their employees or that employers want to give to their employees.

The board also wants it known that it resents criticism of its failure to apply an ice pack to wages. It says that's impossible as long as prices, which are the heart of the cost of living, continue to flutter higher. The best WSB can do is apply dampers. Its job is to stabilize, not freeze.

Righteous Indignation?—Contrary to widespread opinion, WSB maintains, it is not labor unions alone that are to blame for the pressure for higher wages. By actual tabulation, 47 per cent of the applications for wage increases so far have come from employers whose plants are not unionized.

Greatest pressure for higher wages comes from employers who want,

Wage Stabilization Board Commentary on Labor

Using the right bait?

first, to keep their present employees content, second, to attract to their plants any available workers—even if it means pirating workers from other plants.

Half Again as Much—Some employers actually want to increase their wage rates as much as 50 per cent. WSB isn't having any of that. It says it is approving only those increases that are needed to bring the level of wages into normal relationships. And those that are necessary to compensate for the increased cost of living.

On one matter of policy there is close-knit unity among WSB members: If escalator clauses in labor contracts are good for some employers and their workers, they're good for all employers and all workers.

WSB will permit reopening of labor contracts every six months as long as the inflationary fuse continues to burn.

And who is to stomp it out?

Labor Pot Boils

Charges that job opportunities are being withdrawn from Detroit are keeping the labor pot at a boil.

"Exploratory" discussions between Ford Motor Co.'s Vice President John S. Bugas and UAW Chieftain Walter Reuther were held, with subjects being: Transfer of certain operations from the Rouge plant to Ford's new facility at Cleveland; work scheduling in the Rouge steel mill during its expansion; and discontinuance of operations at Iron Mountain, Mich.

Threat of a strike by UAW Local 600 at the Rouge led to the Bugas-Reuther meeting, the international union turning thumbs down on the strike pending a series of talks with Ford management.

Disagreement between GE's Carboloy Department and UAW Local 771 over transfer of certain operations to a new plant at Edmore, Mich., and over severance pay led to a walkout on Sept. 14.

Ex-Cell-O Corp. also is strike-bound by UAW, the primary issue being whether the "merit spread" contract provision will be allowed to stand. The union wants it eliminated.

The UAW is having internal trouble also. When members of the local at Warner Gear Division, Muncie, Ind., Borg-Warner Corp., accepted a wage increase of nine cents an hour, Emil Mazey, international UAW-CIO secretary-treasurer, vowed he would fight the contract's approval. Calling the increase "substandard," and charging negotiations on the local level give B-W "the opportunity of dividing and conquering," Mr. Mazey said the contract should provide for a 14-cent hourly increase to conform with the UAW pattern.

Meanwhile, a series of union mass meetings is being scheduled. First is in Flint on Sept. 30. Walter Reuther plans to address UAW members on what action the union is taking to prevent unemployment in areas where curtailed civilian production is becoming evident.

Taking Up Some Slack

Defense work, in scattered instances, is taking up the slack resulting from civilian goods production curtailment.

In Detroit, where the gap is wide,

METALLURGISTS AROUND THE MOUNTAIN: Three of 19 Japanese metallurgists, who are delegates to the World Metallurgical Congress, meet around a Japanese print of Mt. Fujiyama with W. H. Eisenman, executive secretary of the American Society of Metals. The Japanese group will make a city-to-city inspection of various steel mills before attending the Congress in Detroit Oct. 14-19. Delegates shown are (left to right): Dr. Yoshio Ishihara, steel man from Kamakura, Japan; Dr. Tokushichi Mishima, professor at the University of Tokyo; Mr. Eisenman; and Nobuo Abe, secretary of the Japanese delegation visiting this country

Kaiser-Frazer Corp. reports it has recalled virtually all employees who were furloughed when its Willow Run plant's partial conversion was begun. Of some 5000 men idled when automotive lines were compressed to make room for aircraft production only 800 remain on the seniority list. Recall of probationary employees should begin next month.

K-F has booked a new aircraft subcontract, this one from Boeing Airplane Co. for machining of about 90 different aluminum forgings for the B-52A. Production on the contract is expected to begin at K-F's wholly owned subsidiary, Kaiser Mfg. Co. in Richmond, Calif., in about three months. K-F additionally is building components for the Lockheed P2V patrol bomber in Oakland, Calif., and is tooling its Dowagiac, Mich., plant for manufacture of Wright R-1300 reciprocating engines.

A new plant in Indianapolis originally designed to house automatic transmission manufacture by Chrysler Corp. will be used for production of parts for the Pratt & Whitney J-48 jet engine, as well as transmissions. Completion of the facility is expected by November. Containing about 650,000 square feet of manufacturing floor space of which about 200,000 will be devoted to defense work, the plant will employ about 4200 when full schedules are attained.

'Sequential Seniority'

That's the name used to describe a step-by-step system for worker promotion at Weirton

JOB-TO-JOB routes through the ranks to top paying jobs were guaranteed under a new seniority agreement between Weirton Steel Co. and the Independent Steelworkers Union.

The unique agreement is based on a term that you're not likely to find in any labor dictionary. It's called "sequential seniority." Its definition: Seniority protection based on an employee's right to move up the ladder through a specified step-by-step sequence of promotions. The steps are charted in the union agreement.

Something Old, Something New—The company-union agreement was adopted after a broad study of seniority measures throughout industry. Company and union officials herald it as the establishment of a new landmark in labor-management relations. In the steplike development plan employees are provided with training for the next higher post they attain when there's a vacancy. Seniority provisions of the agreement protect the employee's promotional progress. His company-wide and departmental seniority give him protection if there is a reduction of forces. Company-wide seniority determines vacations, severance pay and work reserve.

In the Pay Line—For job-to-job progress the new plan divides the company's plants into 11 departments, each department having a number of sequential lines of progress up which the employee may travel. Employees have the right to shift from one seniority unit to another, but any employee making such a shift must enter the new sequential division at the bottom level.

Each department has its own labor pool to which new employees are assigned. The pools serve as the bottom step of the sequential ladder. Sequence normally will follow the pay line; higher paying positions are listed higher on the sequential charts which, according to the agreement, will be posted in every department throughout all of the company's plants.

Engineers To Meet in Chicago

An address by H. W. Johnson, vice president, Inland Steel Co., and a tour of U. S. Steel Co.'s Gary Sheet and Tin Mill are features planned for the four-day annual convention of American Iron & Steel Engineers. The 1951 meeting will be held Oct. 1-4, at the Sherman Hotel in Chicago.

All divisions of AISE have technical sessions scheduled. These include: One mechanical, two lubricating, three electrical, two combustion, four operating practice, one rolling mill and one standardization. Tour of the Gary Works will be made on Oct. 2, at 2 p. m.; Mr. Johnson speaks to the group Wednesday at the same time.

AISI To Open Technical Series

First of the 1951 series of regional technical sessions planned by the American Iron & Steel Insitute will be held Thursday at Hotel Thomas Jefferson in Birmingham. An address by William M. Kelley, vice president of Republic Steel Corp., "Standard Steels in the Defense Effort," will follow opening remarks by AISI President Walter S. Tower in the evening session.

In the afternoon, members will hear the following papers: "Use of Zirconium as a Substitute for Manganese", by Dr. W. W. Austin Jr., Southern Research Institute; "Reinforcing Bar Quality and Design", by H. W. Bullard, Tennessee Coal, Iron & Railroad Co.; "Briquetting of Fine Ores", by H. A. Byrns, Woodward Iron Co.; and "Multiple Burners in Open-Hearth Furnaces", by H. T. Watts, Republic Steel Corp.

One-Coat Porcelain on Non-Premium Steel

Cutting costs and sidestepping scarce materials, a new process solves a problem on which the porcelain enameling industry has been working for a long time

A NEW ONE-COAT porcelain enamel process which does not require premium-priced enameling sheet and which produces a nonchipping, noncracking finish is revealed by an Ohio company.

In the recent past there has been a one-coat porcelain enameling process but it was made possible through a special sheet that carries a premium price.

The new process was developed by the Strong Mfg. Co., Sebring, O., which calls it Ti-Loc. Strong has been using the new process since May in producing fluorescent lighting fixture reflectors for Westinghouse Electric Corp.'s plant at Cleveland.

Chip Resistant — Not only does Ti-Loc process eliminate the ground coat that has been customary in porcelain enameling but, Strong says, produces an almost indestructible finish. A sheet enameled by the Ti-Loc process can be sheared, sawed, drilled or punched without the enamel chipping off or cracking. When the sheet is dealt a heavy blow the sheet bends, and the enamel bends too.

Total thickness of the new one-coat enamel is approximately 0.004 inch, about half the thickness of the ordinary two-coat porcelain enamel. This thinness, along with great adherence, contributes to the flexibility of the coating.

Two-Way Saving—The new process saves production costs two ways: On materials, on labor. By using only one coat instead of two, less materials are needed. Elimination of the customary ground coat dispenses with the need for cobalt, which is in short supply and needed for the defense program. Use of a nonpremium steel sheet also contributes to cost-saving on materials. Need for only one coat of enamel, instead of two or more, reduces labor costs. Since only one coat, and not two, has to be fired, fuel costs are cut.

The Strong company believes its new process can be competitive with organic finishes.

Out in Front—Strong's accomplishment comes in a field where numerous other companies are working. The entire porcelain enameling industry has been striving to eliminate ground coat, eliminate chippage and produce a lower-priced product.

The Strong company has applied for a patent on its process.

Thus far, fluorescent light fixtures are the only products Strong has put into production with the new process, although the company reports great success with the process on many other items.

Strong's principal products are lighting fixtures, refrigerator pans, roaster pans and similar items. The company, of which William C. Miller is executive vice president, is presently employing 500 people.

Drop for Porcelain Enamelers

Insufficient steel supplies cut manufacturers' shipments of porcelain enameled steel plumbing fixtures in the second quarter below those of the first quarter, the Porcelain Enamel Institute reports.

Second-quarter shipments were valued at $15.2 million, $3.5 million less than first-quarter shipments. They were, however, $1.7 million above shipments in the second quarter of 1950.

Porcelain enameled steel plumbing fixtures shipped during the second quarter of 1951 included 62,213 lavatories, 305,015 kitchen sinks and 114,837 bathtubs. The latter were the only fixtures which showed an increase over first-quarter shipments.

Wash Day Blues

Lowered output of household washing machines, ironers and dryers in 1952 is forecast by the National Production Authority.

It made its statement on assumption that first and second-quarter 1952 allotments of steel, copper and aluminum probably will be cut below fourth-quarter 1951 allotments to sustain the mounting needs of the rearmament program.

Consideration in setting first-quarter 1952 allotments will be given to the minimum national needs for home laundry equipment, NPA said.

Until the Defense Production Administration screens all requirements and balances the urgency of military and civilian items against the availability of supplies, the amounts available for consumer items like laundry equipment cannot be determined nor percentages of allotments established, NPA pointed out.

Manufacturers of home laundry equipment protested to NPA that the fourth-quarter CMP allotment rate would provide for the annual manufacture of only about 2.3 million washing machines. The country's annual minimum need, they estimated, is: 2,971,000 washing machines, 220,000 ironers and 360,000 dryers. These figures represent about 70 per cent

SPACIOUS QUARTERS: This gear machining building is part of a three-year multimillion dollar expansion just completed at International Plainfield Motors Inc., subsidiary of Mack Trucks Inc., in Plainfield, N. J. About 700,000 square feet of new manufacturing, testing, heat treating, shipping and administrative space will be provided by five new buildings and alterations to five existing structures. Highlight of the construction is a motor test building housing 44 engine testing setups to subject engines to the equivalent of severe road tests. Dynamometers use energy generated during these tests to supply more than 40 per cent of the plant's electrical and heating requirements

of base period production (first half of 1950).

Houdaille Holds Sales Level

Loss of civilian work doesn't mean that an established company must blow away. Proof of this is Houdaille-Hershey Corp., Detroit, which expects to maintain its sales volume at about the level of the second quarter with shipments on defense contracts.

Already shipments are being made of track links for tanks at the Chicago plant, rocket bodies at Buffalo, and parts for military trucks at other plants. Houdaille is also tooling up for a contract on airplane engine connecting rods at its Decatur, Ill., plant, and making preparations to produce projectiles for the Navy in a government-owned plant in the same town.

While maintaining the sales volume, some drop in earnings is expected. Lower profit margins on government work and high labor and materials costs team up to produce that effect.

Abrasive Metals: Strength, Polish in Metalworking

THE IMPACT that the metal abrasives industry (shot, grit, clipped wire) makes on metalworking is greater in the aggregate than appears from tiny metal pellets hardly ever larger than 0.0661-inch in diameter. Yet the industry, made up of about 20 companies that will do a $8 million to $10 million business this year imparts strength and polish to an industry that will do a $102 billion business this year.

The great bulk of metal abrasives has already been drafted for defense purposes: From 50 to 80 per cent of the shot and grit is going into defense or defense-support activity.

Order of Importance—Great users of shot and grit are foundries, automotive plants and enameling shops. Forge shops also use the product in quantity and one important user outside metalworking is the stone and granite industry.

Big problem facing manufacturers of abrasive metal is, of course, materials. Making shot and grit is a foundry operation. Shot is produced by a drop gravity process, chilled and hardened in water. Grit is made by crushing shot in a ball mill. Most shot or grit produced is of chilled iron made from cast iron scrap; some makers use cast steel scrap for product.

At least one company makes a range of nonferrous shot—copper, zinc, tin, aluminum, nickel and Monel. Big nonferrous volume is in copper, though, and is used for copper alloying and plating mostly and in isolated cases as a blast cleaning material in nonferrous foundries. Phosphor-copper is used by brass foundries as a deoxidizer; 50-50 copper-nickel shot is used by foundries for the introduction of small nickel alloying elements in bronze. Shot is sometimes bought in tonnage lots; one arsenal buys it regularly in such quantity.

Most shot producers think they're getting a fair shake from the Office of Price Stabilization since a price increase was granted last year.

Hammer and Chisel—Angular grit acts like thousands of minute chisels that open up the surface of a metal and expose any defects in the material being cleaned. Its effect is to give a matte finish that is suitable when a finished piece is to be enameled, plated or metallized. Shot, being round, is used for tough scale conditions that must be cleaned by heavy shock and impact—in an action similar to many ball peen hammers.

ABRASIVE METALS
. . . bulk goes for defense

Only comparatively recently has the strengthening effect of shot peening been recognized. Now automotive and aircraft companies particularly use abrasive metal to increase fatigue life of such things as coil springs, crankshafts, connecting rods, gears.

Clipped wire has dual effect, one of chiseling when it falls on its clipped edge, one of peening when it hits on its side.

Remedy for Scrap Shortage

Flow of vitally needed scrap to the steel mills could be bolstered by revision in the government ceiling price regulation on scrap.

That's the belief expressed by Edwin C. Barringer, executive vice president of the Institute of Scrap Iron & Steel Inc., at Detroit before the Michigan chapter of the institute.

"When top-level defense officials talk to local scrap mobilization chairmen and scrap and steel industry representatives about a shortage of scrap they are addressing the wrong people," believes Mr. Barringer. "What is needed is immediate action to get the Office of Price Stabilization off dead center and clarify situations that are not conducive to a greater flow of scrap.

"To cite only two important adjustments, the five principal open-hearth grades should be combined at one price level, as was done by OPA in World War II and has been recommended by both the steel and the scrap industries; this level ought not be below the present level of No. 1 heavy melting steel. Recent OPS actions on the price of meat and automobiles shows that a decision can be made." Mr. Barringer exclaimed.

"Another basic adjustment is clarification of the regulation to indicate just where water rates can be used to compute shipping point prices. Specific recommendations from both consumers and scrap dealers have been before OPS for many months.

"Especially in view of the urgency of the supply situation and the desire of dealers to co-operate with the various drives is it desirable that this and other clarifications be effected immediately," he declared.

Harvey's Loan Hits Snag

Effort of Harvey Machine Co. of Kalispell, Mont., to get into the aluminum production business hit a snag.

The $46 million loan which had been authorized for it by the Defense Production Administration (see STEEL, Sept. 3, 1951, p. 63) has been held up at the request of the Department of Interior.

The department said there is the possibility there will not be enough electric power to run Harvey's plants once they are constructed, and arranged with the DPA and Reconstruction Finance Corp. to refrain from disbursing money on the loan until Interior officials can re-examine the electric power situation in the Pacific Northwest.

The Harvey firm was granted the loan a few weeks ago after long ne-

gotiation with the government. Harvey planned to use the money in building an aluminum reduction plant at Kalispell, Mont., and an alumina plant at Everett, Wash.

Harvey Machine Co. of Montana is a subsidiary of the Harvey Machine Co. Inc. of (Torrance) California.

Navy Earmarks Demon Jet

The Navy's newest jet fighter, the McDonnell F3H-1 Demon, will be built by McDonnell Aircraft Corp., St. Louis, and Goodyear Aircraft Co., Akron. Letters of intent, covering the two prime contracts, were sent by the Department of the Navy; dollar values and number of planes involved were not disclosed.

The F3H-1 Demon, powered by a Westinghouse jet engine, successfully completed its first test flight at Lambert Field, St. Louis, on Aug. 7.

The new carrier-based fighter is the first airplane to be developed by McDonnell since the F2H Banshee, also made for the Navy. The Demon represents Goodyear's first contract for military aircraft since the end of World War II. At that time Goodyear was producing Corsairs.

McDonnell will make the plane at its St. Louis plant, and Goodyear production will be at its Akron plant.

THE NEW McDONNELL F3H-1 DEMON IN FLIGHT
. . . to be built for the Navy by McDonnell and Goodyear

Lubrication Equipment

Greasing the ways for industry will be big business this year for its makers

FRICTION—enemy of every metalworking machine—is fighting a losing battle with modern lubrication equipment.

The battle is being waged by some 40 companies whose job is getting precise amounts of oil or grease to machine bearings at the right time. Their arsenal of weapons includes equipment ranging from tiny sight feed oilers to huge centralized systems that supply an entire plant with lubricants. Most makers concentrate on small units and volume business, but the biggest portion of the lubricating dollar goes to a half-dozen large firms that make centralized systems.

Stitch In Time—Savings in costs and increases in production that result from proper lubrication have been getting increasing recognition in the past fifteen years. The lubrication equipment industry has grown by leaps and bounds since the mid-'30s and is ballooning again this year. Several manufacturers say their '51 volume could be half-again that of last year.

Biggest customers dollar-wise for oiling and greasing equipment are machine tool builders, rolling mills, crane and conveyor manufacturers, locomotive builders and makers of calendering and textile machinery. Because of the variety of uses there is no such thing as a typical lubrication system. They can be roughly categorized as hand or automatic, oil or grease, and as to use—which depends on points of lubrication and type of equipment on which used. In the industrial field alone there are about 20 classifications ranging from the hand-filled grease gun to package units custom tailored for specific machines.

Case History—If you are considering putting a centralized lubrication system on a machine, you can figure the equipment and installation cost as being between 1 and 2 per cent of the machine's value. Smaller machines may run as high as 5 per cent. The average semiautomatic oil system—including pump, piping and injectors—would call for an outlay of about $3 per bearing installed. An automatic grease system installed runs about $6-7 per bearing.

One company that installed centralized systems on its lathes thinks the cost well justified. It found maintenance costs were reduced 60 per cent and production boosted one-fifth. In addition to lowered downtime, scrappage was reduced and quality of finished products improved.

No Guesswork—Application of lubricant to bearings is getting to be a scientific procedure. Makers of lubrication equipment are enthusiastic over recent technological advances in their field. Automatic and semiautomatic systems take all the guesswork out of oiling and eliminate the human element. Over-lubrication can do as much harm on antifriction bearings as can be accomplished by underlubricating. Closed systems that give contaminants no chance to get into bearings are of vital importance in some applications; fog and spray systems are getting more use for open gearing.

Centralized systems are often automatic-feed types, with precise setting of operating cycle. Such systems often have alarm devices to warn of break in piping, empty reservoir or faulty air or electrical system.

On Hand—Even with increased demand, you can still get immediate delivery on most standard types of oil or grease equipment. That may be because manufacturers have had relatively few materials or labor problems in comparison with some segments of metalworking. The biggest materials problem this year was shortage of hexagonal cold-drawn bars that are used for fittings and injectors. Some makers think CMP helped them over that pinch. They don't know whether the situation will remain eased, but think it's nice not to have to fight for every pound of metal they get.

Budd Builds to Meet Demand

Budd Co., Philadelphia, is expanding outward and upward to meet the increasing demands of civilian and defense work. It is erecting a 300,000-square-foot building on its Hunting Park (Philadelphia) property plus a 65,000-square-foot addition at its Chase plant in Gary, Ind. Most of the money for the expansion will come from working capital, officials say, but the company is also increasing a loan from Equitable Life Assurance Society by $7 million.

Better Contact for Contracts

A Defense Contract Department, to maintain close liaison with Defense

Department procurement officials, was established by Bausch & Lomb Optical Co., Rochester, N. Y. Materiel furnished the Army, Navy, and Air Force includes aerial camera lenses, submarine periscopes, mapping equipment, binoculars, searchlight reflectors, optical glass, Stereo Trainers, rangefinders, and optics for bomb sights.

During World War II, Bausch & Lomb attained one of the nation's top production records, producing over 5 million pounds of optical glass, over 1000 binoculars per week, thousands of photographic lenses, and was the sole manufacturer of large rangefinders for the Navy.

Solar Gets 'Hot' Parts Order

Cementing its position as one of the nation's foremost manufacturers of "hot" jet engine parts is Solar Aircraft Co., San Diego, Calif. It received an $8 million order from Packard Motor Car Co., Detroit, for J-47 turbojet engine parts. Bulk of the parts will be made at Solar's Wakonda plant, being completed in Des Moines, Iowa.

Included in the parts Solar will make are aft frame, exhaust cone, turbine casing, transition liners, and inner and outer combustion chamber liners. Delivery of the jet engine parts to Packard will not begin until March of next year.

More Minesweeper Contracts

In the second group of minesweeper awards made by the U. S. Navy Bureau of Ships this year, 17 shipyards have contracts to build 26 minesweepers and 42 auxiliary minesweepers. All but one of these shipyards are classified as small business firms.

Contracts cover the construction and outfitting, except for special items to be furnished by the Navy and material, such as fire-fighting equipment, being furnished through central procurement agencies. Unit prices of the vessels, excluding that furnished by the Navy and central procurement agencies, range from $587,599 to $1,813,675.

Shipyards awarded contracts are: Borward Marine, Ft. Lauderdale, Fla.; M. M. Davis and Sons, Solomons, Md.; Hogdon Brothers, East Boothbay, Me.; Tampa Marine Corp., Tampa, Fla.; Higgins Inc., New Orleans; Pacific Boatbuilding Co., Tacoma, Wash.; Stephens Brothers Inc., Stockton, Calif.; Lake Union Drydock Co., Seattle; National Steel and Shipbuilding Co., San Diego, Calif.; Tacoma Boatbuilding Co., Tacoma, Wash.; Berg Shipyard, Blaine, Wash.; Martinolich Shipbuilding Co., San Diego, Calif.; Colberg Boat Works, Stockton, Calif.; J. M. Martinac Shipbuilding Co., Tacoma, Wash.; Seattle Shipbuilding and Drydock Corp., Seattle; Bellingham Shipyards, Bellingham, Wash.

COMBAT COMFORT: Frontline troops in Korea are getting an unexpected luxury—for them, anyway. The blessing is hot showers, provided by this two-wheel trailer unit developed by the Army Quartermaster Corps. Towed behind a jeep, the unit is set up beside a stream or pond, and inside of 20 minutes puts out 24 jets of comfortably warm water that's heat-treated to kill bacteria. Since tremendous heating and heat-transfer capacity has to be packed into a small space, the boiler and heat exchanger system is built entirely of stainless steel. Cleaning and descaling is done with a nitric acid solution

Defense Ordering: Billion-Dollar-a-Week Rate

OPPORTUNITIES for prime and subcontracts on defense work are still unfolding. Defense Mobilizer Charles E. Wilson estimates the government is ordering at the rate of $1 billion a week. That means a lot of orders for someone.

Part of this huge kitty of military contracts was obtained by White Motor Co., Cleveland, in an $8 million order for 1410 trucks, tractors, dumping units and spare parts. The company's defense work, which amounted to only 5 per cent of its volume in the first half of 1951, will now be considerably increased.

Also taking a share of defense contracts is Kaiser Mfg. Corp., a subsidiary of Kaiser-Frazer Corp., Willow Run, Mich. Kaiser will machine 90 different aluminum forgings for the Boeing B-52A airplane in Richmond Shipyard No. 2, San Francisco. The plant requires $6 million in modifications to do the defense work.

Tooling orders are now being placed for defense work at the new plant in Indianapolis of Chrysler Corp., Detroit. Completion of the plant is expected in November. Chrysler will make both car parts and jet engine parts there. 200,000 of the 650,000 square feet being occupied by work on components for the Pratt & Whitney J-48 Turbo-Jet aircraft engine.

A pair of development projects for the government, which may well mean more subcontracts later, were awarded to Consolidated Vultee Aircraft Corp., San Diego, Calif., and Ryan Aeronautical Co., San Diego, Calif. Convair will do research on development of a new high performance interceptor airplane. Ryan was chosen by the U. S. Navy Bureau of Aeronautics to develop a new type of electronics equipment. Details on the equipment are still classified information.

Other contracts awarded by the government, in excess of $250,000, follow:

Product	Contractor
Road Graders (2 contracts)	Rome Grader Corp., Rome, N. Y.
Clamshell Buckets	Four Wheel Drive Pacific Co., Los Angeles
Spare Parts	Thew Shovel Co., Lorain, O.
Snow Plows	Klauer Mfg. Co., Dubuque, Iowa William Brothers Boiler & Mfg. Co., Minneapolis, Minn.
Cranes	Bay City Shovels Inc., Bay City, Mich. R. G. LeTourneau, Peoria, Ill.
Trucks, Stake and Platform	International Harvester Co., Chicago
Cross Drive Transmissions	Allison Division, General Motors Corp., Indianapolis, Ind.
Feed Mechanisms	Davis Aircraft Engineering Inc., Lowell, Mass.
Range Finder for M47 Tank	Northrop Aircraft Inc., Hawthorne, Calif.
Generator Sets, 30 kw	R. H. Sheppard, Hanover, Pa.

CHECKLIST ON CONTROLS

GOVERNMENT control orders are digested or listed each week in this "Checklist on Controls." For complete copies of NPA orders, write to NPA Distribution Section, First Basement, New GAO Bldg., Washington 25. For copies of OPS orders, contact nearest OPS district or regional office. For copies of OPS news releases, write David S. Phillips, director, OPS Administrative Services Division, Temporary E Bldg., Washington 25.

Materials Orders

COTTON DUCK—Amendment of Sept. 17, 1951, of NPA Order M-53 permits looms reserved exclusively since April for production of flat duck to be used to make other fabrics.

PRINTING PLATES—Amendment of Sept. 17, 1951, of NPA Order M-65 simplifies compliance with and administration of this order covering conservation of critical materials in printing plates.

NICKEL SILVER — Amendment of Sept. 17, 1951, of Schedule A to NPA Order M-80 permits use of nickel silver in manufacture of functional parts of certain musical instruments.

Controlled Materials Plan

ORDER RESTRICTIONS — Amendment of Sept. 17, 1951, of Direction 3 to CMP Reg. 1 permits manufacturers to order up to 40 per cent of their quarterly allotments of steel, copper and aluminum in any month of a quarter. Previously manufacturers were permitted to schedule not more than 35 per cent of their quarterly allotments of controlled materials for delivery in any one month.

NPA Regulation

NEW PRIORITY SYMBOL—Amendments of Sept. 13, 1951, of NPA Reg. 2 and CMP Reg. 3 establishes a new symbol, DX, to be applied by NPA to orders calling for products, components or materials other than steel, copper or aluminum when delay in delivery would jeopardize top-urgency defense programs.

Price Regulations

MACHINERY RESELLERS—Amendment 2 of Ceiling Price Regulation 67 permits resellers of machinery and related goods to use their ceiling prices established under the General Ceiling Price Regulation or Supplementary Regulation 29 while awaiting price approval from the Office of Price Stabilization. Amendment 2 was effective Sept. 22, 1951.

Sellers' Privilege Endangered

Steel companies may loose their recently acquired privilege of choosing a large share of their orders from their established customers. This privilege was granted in August by the National Production Authority in its Direction 3 to NPA Order M-1.

The Defense Production Administration and National Production Authority are hearing increasing criticism that steel companies are using the "pick and choose" privileges of Direction 3 to switch back to their previous custom of giving customers tonnage quotas based on their historical pattern.

As a result, DPA and NPA are considering remedial action, either in form of a revision of Direction 3 or its complete withdrawal.

Help Ahead for Ticket Holders

Action to take care of consumers who have not yet been able to "cash" their CMP tickets for steel appears to be definitely in the making.

The situation over failure to "cash" tickets continues to worsen, with hundreds of consumers reporting inability to find a home for their fourth-quarter CMP tickets and with many more able to place only a fraction of the tonnage called for in their CMP tickets.

The situation has become so serious that it cannot be ignored, and it now appears definite that some program of action will be instituted to take care of all of these users, at least to some extent. But such action is being held over until early October when cancellations of duplicate and unvalidated tonnages will have taken place and the real fourth-quarter supply situation will have become clearer.

Unique Method for Missiles

A unique method of connecting hydraulic servo mechanisms with their actuating controls has been devised for a missile application through use of the Al-Fin process, the Al-Fin Division, Fairchild Engine & Airplane Corp., Farmingdale, L. I., N. Y., announced.

The Al-Fin process is a method of molecularly bonding aluminum and steel.

A simple, compact and lightweight housing is produced which contains not only the connecting lines but also houses the actuating pistons so that the hydraulical cylinders become, essentially, integral parts of the unit. Pressure hydraulic connections are thin-walled steel tubes preformed to follow their required paths.

The tubes are bonded into the aluminum with the ends blind. Admission of hydraulic fluid to the chambers which form the hydraulic cylinders is through slots milled into the tubing. Drilled holes of the proper cross-section tap the lines for connection to the controls. Sealing at the control connection is made simple through use of "O" rings. Because of the bond between the walls of the tubing and the aluminum, there can be no leakage between the tapped holes.

Besides being extremely compact and light, the unit simplifies installation considerably, for numerous high pressure hydraulic connections are eliminated by a single, easily mounted housing.

NO RETURN TRIP, THOUGH: The Air Force is forming a combat unit to use these "pilotless bombers", the Matador B-61. One of the newest twists with guided missiles, the deadly U. S. weapon is shown on a launching ramp at the Air Force's long range proving grounds at Coca, Fla.

Windows of Washington

By E. C. KREUTZBERG *Washington Editor*

Recognition of small business is growing. The armed services are doing much to help little fellows get contracts; the Smaller Defense Plants Administration may do more

AWARENESS of small business as an important cog in the defense mechanism is growing in Washington. Witness the change the Air Force made in its procurement set-up: Small businessmen may now get information on negotiated contracts at regional and district procurement offices instead of through Air Materiel Command headquarters.

Army Ordnance, too, is helping out. It has a small business specialist in each of its 14 procurement offices besides a chief of small business in the Office of Chief of Ordnance. Right now small business is getting half of all ordnance business. And those are only two examples. NPA made a six months study of what small business is, to establish a position for it in the mobilization program.

Needed: An Administrator — Even brighter days for small business may be ahead—once the Smaller Defense Plants Administration (SDPA) is implemented. Late last week the President had not named an administrator. Maury Maverick may be named or the President may leave it up to Sen. Paul Douglas to do the naming. Small business sponsors would rather see an industrialist get the job and may get their way. Chances for a prominent Cleveland industrialist getting the job are considered good.

SDPA, counterpart of World War II's Smaller War Plants Corp. (it handled 12 big war contracts), might be used as a club to force bigger business to divvy up contracts with small business. But small business would rather see it used as a co-ordinating agency.

Good Faith as Defense . . .

The House Judiciary Committee concluded hearings on S. 719, the Senate-passed bill which would establish good faith as a defense to a charge of price discrimination to meet the equally low price of a competitor.

A Rod but No Staff . . .

Anomalous because of its utter inadequacy is the action of the Senate in approving a $50,000 appropriation to expand its Appropriations Committee staff. By resolution of Senator Ellender (Dem., La.), the amount was to make possible an enlargement of the "overworked staff." Actually, the appropriation will permit the committee to employ a number of additional competent people, but it will make only a nominal dent in the chief defect of the existing set-up under which Congress just does not have the staff to take care of the country's legislative needs.

Military Yields Stainless

Civilian product manufacturers will obtain more stainless steel during the fourth quarter than had been promised them. The armed services, after reviewing their needs last week, freed 20,330,000 pounds of stainless which now will be distributed among civilian goods producers. This amounts to 7 per cent of estimated stainless production in the fourth quarter.

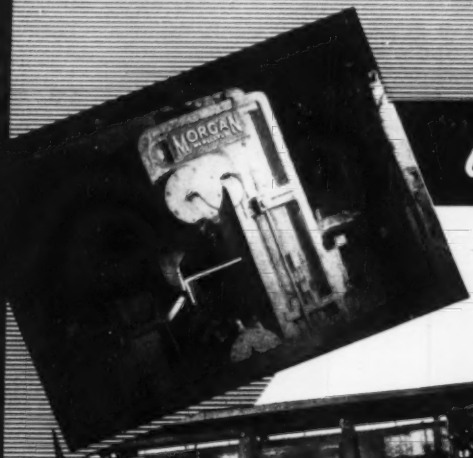
About one third of the windfall, 7,470,000 pounds, will go to the automotive industry. This will give the industry 90 per cent of what they wanted to use in the last quarter for trim and brightwork.

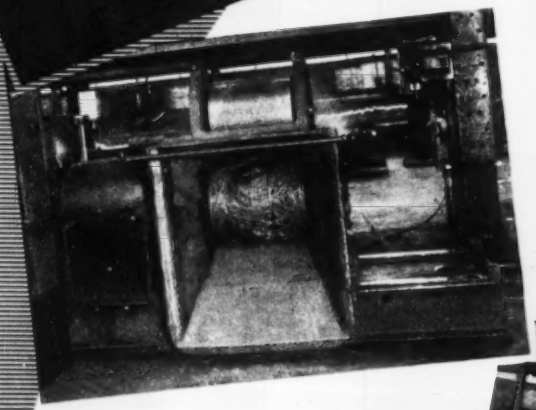
A slightly larger chunk, 8,600,000 pounds, will be distributed among makers of other consumer durable goods—refrigerators, vacuum cleaners, toaster, washers.

The remainder will go to miscellaneous users.

ALL TOGETHER NOW, ONE, TWO, THREE, FOUR: Concrete results of the unification policy were shown at Michigan City, Ind., recently when members of the four branches of the Armed Forces accepted delivery of a standard railroad box car through a single procurement. Delivered were 212 of the PS-1 box cars from Pullman-Standard Car Mfg. Co., Chicago: 150 to the U. S. Army Transportation Corps; 39 to the U. S. Navy; 13 to the U. S. Air Force; and 10 to the U. S. Marine Corps. Standing near the PS-1 cars are representatives of the different service branches

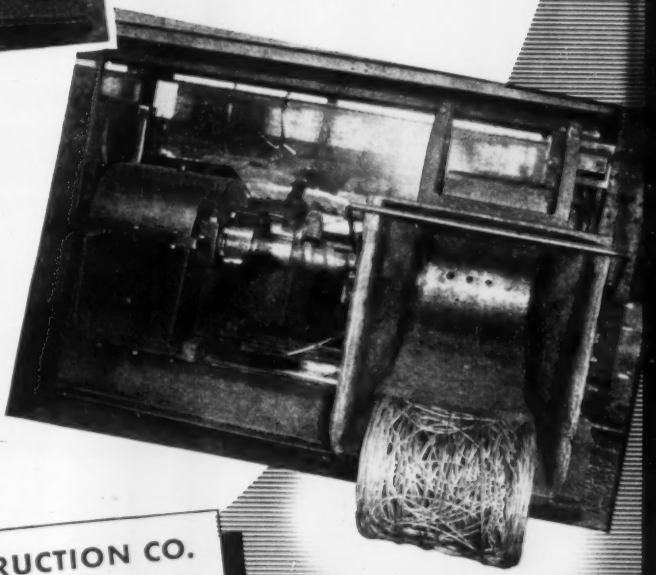
CLEARS COBBLES in a HURRY!





When a red hot bar starts whipping around the mill—everybody ducks. Production comes to a standstill until the cobble is cleared away.

Yes, this happens occasionally . . . even in a Morgan mill. But, Morgan has a special treatment for handling the situation . . . speedily and safely.



At the touch of a button the new Morgan Electric Crop and Cobble Shear begins chopping that part of the cobbled bar still coming through the mill. The sheared lengths drop into the charging box below. At the same time the new Morgan Cobble Bundler quickly winds the balance of the cobble into rolls that can be easily handled and placed in open hearth charging boxes.

Other Morgan innovations that contribute to efficient rolling mill operation will be discussed in future advertisements. If you can't wait, let us tell you about them now. Just write:

MORGAN CONSTRUCTION CO.
WORCESTER, MASSACHUSETTS

Rolling Mills - Morgoil Bearings - Wire Mills
Regenerative Furnace Control - Gas Producers - Ejectors

English Representative: International Construction Company
56 Kingsway, London, W.C. 2, England

RM-39

SAVE SHOP LABOR SHOP TIME GRINDING COSTS

ELIMINATE THE GRINDING OPERATION ON YOUR STEEL BARS WITH

GROUND and POLISHED STRESSPROOF

SEVERELY COLD-WORKED FURNACE-TREATED STEEL BARS

STRESSPROOF PROVIDES 4 QUALITIES IN 1 BAR

1. **Eliminates Heat Treating**
   Its *in-the-bar* strength, as received, is twice as great as ordinary cold-finished steel shafting.
2. **Eliminates Case Hardening**
   Its resistance to wear, as machined, is sufficient to replace many heat-treated or carburized steels.
3. **Minimizes Warpage**
   Because it is *stress-relieved*, this superior bar assures the user a minimum of distortion.
4. **Speeds Up Machining**
   Has *in-the-bar* machinability fully 50% better than heat-treated alloys of the same hardness.

Many companies are realizing important savings by using Ground and Polished STRESSPROOF bars instead of grinding the steel in their own shop. For this superior steel provides precision tolerances at a reasonable cost, without tying up valuable labor and machinery.

This all-purpose bar stock is ground to close tolerance and highly polished at the LaSalle plant on batteries of modern machines — at lower cost than you can grind it yourself. Furthermore, because this versatile steel is stress-relieved, it requires no straightening after keyseating, journaling, threading, or other machining operations. And its four qualities in-the-bar eliminate many other costly operations.

Almost all of today's Ground and Polished STRESSPROOF production is going into defense jobs. However, from time to time, some sizes of sample bars may be available for testing purposes.

LaSalle STEEL CO.

1414 150th Street, Hammond, Indiana

Manufacturer of the Most Complete Line of Carbon and Alloy Cold-Finished and Ground and Polished Bars in America.

Duplicate Difficulties in British Industry

British metalworking has shortages in scrap, sheets and skilled labor. Next Dec. 3 controls go on carbon steel distribution which means about 95 per cent of all its steel

JUST ABOUT ALL the problems facing British metalworking today are carbon copies of situations in which the American counterpart finds itself:

Britain is short of scrap. To stimulate its collection, prices of iron and steel scrap were advanced £2 ($5.60) a ton. Imports of scrap mainly from Germany fell from nearly 2 million tons yearly in 1949 and 1950 to an annual rate of less than 700,000 tons in the first half of this year. The new pricing order will probably fix the prices of ferrous scrap for some years to come.

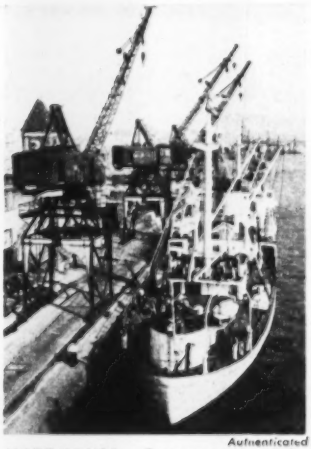
Britain has manpower troubles. The Ministry of Supply can't find enough labor for the defense program. There's been a decline in recruitment in industries manufacturing components for aircraft and automobiles, in electrical machinery and in communications equipment. And, like the U. S., Britain is having its engineering, technical and skilled manpower shortages.

Britain has machine tool difficulties. Requirements for defense purposes are estimated at 35,000 tools. Between 8000 and 9000 will be obtained from the U. S.; 6988 have already been ordered. Their prices: £53 million (about $148.4 million). Over 10,000 machine tools were ordered from the continent; another 8000 were placed with British producers. Most British tool builders have considerable order backlogs; they hope to cut down on them by getting more materials. That would happen through allocation of raw materials. Nearly 50 per cent of the orders under the defense program are already placed.

Britain will control its materials. Next Dec. 3 full control of carbon steel distribution will be introduced. Since 95 per cent of the steel used in Britain is carbon steel, the Ministry of Supply will have full control of the steel supplies for defense and for industry. The allocation system that functioned in World War II will return. British manufacturers feel about controls the way American industrialists looked toward the Controlled Materials Plan. They want them. Their situation has been little short of chaotic because of shortages in the past few months.

British foundries are short of pig iron. They can't get enough to meet their requirements.

Pressure for steel sheets is outstanding. It comes from automakers who have heavy backlogs in home and export trade. Their export position isn't as secure as it was several months ago. Higher prices are tending to reduce sales in overseas markets. British auto manufacturers face keen competition in Western Europe because of the lower prices of the small family cars built by German and Italian producers like Opels, Volkswagens, and Fiats.



Authenticated

MADE IN USA: On every side of the globe American machinery and equipment is at work increasing productivity and raising living standards. In the busy port of Rouen, France, for example, 35 gantry cranes speed handling of goods in transit. Caterpillar diesels supply power for hoists

Authenticated

STIMULANT: The industrial machinery display shown here is part of the Milan International Samples Fair, Milan, Italy—one of the largest and best organized sample markets in the world. It has been operating since 1920. At the 1951 fair, more than 8400 exhibitors were showing their wares over an area of about 2 million square feet. The fair functions throughout the year to stimulate Italian and international trade

Westinghouse Gets Fiat Order

Fiat Co. of Turin, largest automaker in Italy, ordered six main drive motors and complete electronic controls from Westinghouse Electric International Co., New York, for a new 24-stand rod and merchant steel mill. The mill will be used for precision rolling of steel products for autos and airplanes.

Installation of the new mill is the final stage in Fiat's steel expansion program. Besides six main drive motors for the finishing sector being built by Westinghouse, Marelli Co. of Milan, Westinghouse Italian licensee, is supplying 12 motors for the intermediate sector, in capacities ranging from 750 to 1000 horsepower.

Autos Built in South Africa

SWISACOR (Swiss South African Engineering Corp.) is making South African history on a farm just outside Pretoria, S.A. There SWISACOR is building the country's first automobile plant. Manufacture is expected to start next year on the Gutbrod (in English: Good Bread). They will cost about $1150. Once the plant gets rolling (it expects to produce 500 vehicles a month eventually), it will use only South African steel. Only South Africans will be employed.

Two months ago the first Gutbrod lorries were delivered; they were assembled in Pretoria from parts imported from Germany.

Foundrymen Go to Europe

Accelerating its efforts to improve the foundry industry in the western European countries, the Economic Cooperation Administration dispatched a five-man team of American foundry-

men to survey casting plants in Italy and submit recommendations. Costs are being paid by the Italian government. Selected by L. E. Roark, formerly with National Foundry Association and now with ECA's Technical Assistance Staff, the members of the team are: Chairman, George P. Fisher, former vice president, Whiting Corp., Harvey, Ill.; Eugene F. Shultz, foundry plant manager at Pulaski, Va., for General Chemical & Dye Co.; Kenneth L. Smith, formerly of Hansell-Elcock Co., Chicago; James Coutri, foundry labor specialist, Pittsburgh; and James L. Wolfe Jr., formerly with Ampco Metal Co. Inc., Milwaukee.

Pressure on Valve Makers

Industrial valves and fittings are needed for plants, equipment and military end items

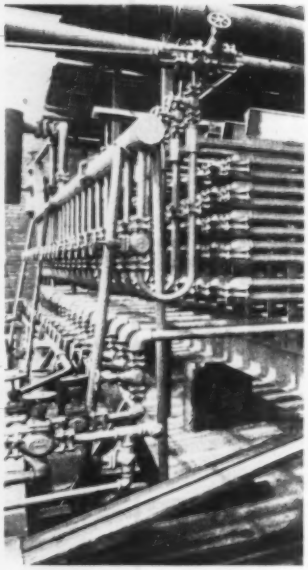
PRESSURE is mounting on valve makers as industry builds up steam for the defense program.

Plant expansion this year may top $25 billion. That'll take a sizable chunk of production. Every piece of equipment in those plants using air, water or gas will need valve regulation. Defense end product uses are numerous. These three alone add up to a hefty backlog for the valve industry. Maximum delivery time prior to Korea was six months; now it's double that for certain sizes and specialties.

Crossed Fingers—Longer waits for valves and fittings will be in store for industrial customers if the materials sky darkens. A heavy cloud is seen in fourth-quarter allotments: Word from Washington is that substantial cuts are coming.

Controlled materials are used in nearly every valve manufactured. Standard globe valve, for instance, is made up of ten to twelve parts. These assemblies often require more than one type of metal or various specifications of the same metal for such parts as stem, seat and body. Important valve metals are iron—both malleable and gray—brass and steel, in that order. Bronze is a common material, and copper alloy supplies are choke-tight. Stainless steel and other alloys are getting a big play for corrosion uses and high temperature-pressure applications; in the past five years the industry has more than doubled its use of stainless.

Where They Go—Rated orders for valves and fittings are running over 50 per cent on an average, probably higher when defense-supporting uses are added. Distribution is largely



MORE PIPELINES, MORE VALVES
. . . long wait for industrial users

through jobbers and dealers so defense volume is difficult to figure accurately. Current big customers are power, petroleum, chemical, navy, atomic energy, aircraft, tank-automotive, heavy industry, paper and gas transmission fields.

Supplying these industries with valves and fittings is a job for 400-500 metalworking companies. Including those making plumbers' supplies, the figure is over 700. About 30 of these are volume producers. Nearly 65,000 workers were employed by the industry in 1949—the latest year for which figures are available. These workers added $385 million value to their products by manufacture in that year.

Split Decision—Not all valve makers are loaded with work. On a tonnage basis there is enough capacity in the industry, though demand ratios have shifted somewhat as in the case of alloy and stainless types. Special manufacturing machinery is hard to come by, but extra shifts could be put on present equipment if materials warranted.

Labor has been plentiful. The twist is that some companies may lose workers they now have unless more metal comes to the fore.

Defense Alters Shipments

Effects of the defense program are showing up in reports on product shipments by the steel industry.

An increasing percentage of finished steel is in the heavier products needed for plant expansions, railroad freight cars and heavy goods, American Iron & Steel Institute reports show.

Percentages of structural shapes, plates and hot-rolled bars shipped from mills in July exceeded those of all previous months of this year. Of the mills' total July shipments of 5,988,574 net tons of finished steel 6.6 per cent (397,455 tons) was in heavy structurals, 10.9 per cent (652,954 tons) was in plates, and 11.5 per cent (689,377 tons) was in hot-rolled bars and light shapes.

More Steel's Coming

If you can't get all the steel you want today, take heart. The iron and steel producing industry is getting more tax amortization encouragement to expand its facilities than any other industry.

Through Aug. 18, iron and steel industry expansions and improvements which the Defense Production Administration had approved for fast tax amortization were valued at $2,527,438,000. Total value of projects approved for all basic materials industries was $5,824,061,000 and total proposed investment in all projects—basic materials, finished products, transportation and storage, public utilities, and miscellaneous—was $9,286,892,000.

From the outset of the tax amortization program, primary emphasis has been on industries producing and fabricating basic materials.

Tax amortization allowed the iron and steel industry through Aug. 18 was on $1,798,040,000, and on all projects the amount on which it was allowed was $6,306,975,000, or 67.9 per cent of the proposed total investment.

By Aug. 18, when the government placed a 60-day moratorium on granting of fast amortization requests, DPA had received 13,900 applications requesting accelerated tax amortization on proposed investments of approximately $23.9 billion.

Purpose of the tax amortization program is to expand private industry's productive capacity quickly to meet mobilization goals. Certification as an important defense facility permits amortization of authorized amounts of a new facility over a five-year period, instead of the customary 20 to 25 years.

Steel Cabinet Makers Organize

There's a new organization in the metalworking field. It's the Steel Kitchen Cabinet Manufacturers Association Inc. Headquarters will be at 1006-1008 Engineers Bldg., Cleve-

land. The new organization, having no connection with the Steel Kitchen Cabinet Institute, represents approximately 90 per cent of the industry capacity.

Officers of the new association are: President—M. M. Miller, president, Miller Metal Products Inc., Baltimore; vice president—F. F. Duggan, general sales manager, American Central Division, Avco Mfg. Corp., Connersville, Ind.; and executive secretary and treasurer—Arthur J. Tuscany, of the association management firm, Arthur J. Tuscany Organization, Cleveland.

The president and vice president and these men constitute the board of directors: Thomas W. Hardy, Murray Corp. of America, Scranton, Pa.; Harry S. Lawrence, Capitol Kitchens, Roselle, N. J.; Robert A. MacNeille, St. Charles Mfg. Co., St. Charles, Ill.; Charles A. Morrow, Mullins Mfg. Corp., Warren, O.; C. S. Motter, Morton Mfg. Co., Chicago; and F. E. O'Connor, Geneva Modern Kitchens Inc., Geneva, Ill.

Safe Bet for a Better Year: Safety Equipment Makers

THE INDUSTRY that takes the term *labor-saving* literally expects a good return on its policy this year: Industrial safety equipment makers estimate their '51 business will be 20 per cent higher than last year's sales.

Metalworking alone will spend some $5 million on such items as fireproof shirts and trousers, protective shoes, respirators, face shields, safety glasses, and protective helmets. Although it is and has been working at peak levels, metalworking will still spend 15 per cent more than it did last year.

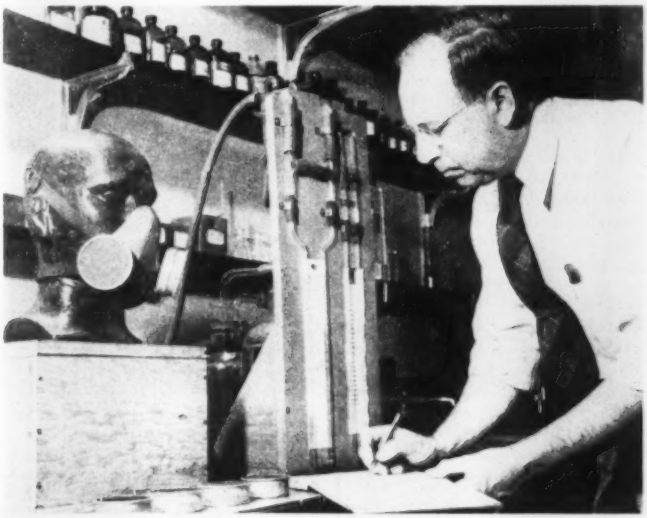
The Human Element—Top priorities are extended safety equipment manufacturers because of the manhours and labor itself that is realized through use of the equipment. Most common items can be delivered from stock immediately against rated orders. Less common items require as long as six months before delivery—rated or non-rated orders. Since most users of safety equipment maintain their own stocks of safety shoes, goggles, clothing, etc., immediate delivery is not too essential. But manufacturers take extra pains to cut delivery to the shortest time possible.

Safety clothing, shoes and face protection items make up the great bulk of sales. Sales of shoes, goggles and masks are about constant from year to year, but safety clothing is covering a growing industrial figure. Equipment like fireproof shirts and trousers, leggings, aprons, hoods, welders' and burners' capes is being more widely used. Largest purchasers of clothing are foundries, melting, forging, scarfing and welding shops and pickling plants. Blast furnace departments account for most sales of self-contained breathing apparatus.

And a Stylish Trend—Safety products in recent years have tended toward lighter weights, greater comfort, better resistance and style. This means wider applications are possible and more assurance the equipment will be used when available.

Plastics that will not scratch are perfected. Safety glasses can be prepared for any prescription. Plastic face shields prove their mettle. Respirators are now more efficient, more comfortable, lighter. The fitted safety clothing that has come into use stems from practical considerations—not the woman's touch: Loose, ill-fitting garments have a greater tendency to catch on machinery. Pressure snaps are substituted for buttons—to facilitate rapid removal.

Fireproofing compounds in the past were water soluble. Now one company has a compound that is washable yet mildew and dermatitis-proof And it won't flame when 3000-degree molten metal is poured right on top of the fireproofed clothing.



TESTING A RESPIRATOR ON A MODEL HEAD IN A SAFETY RESEARCH LAB
. . . today respirators are more efficient, more comfortable, lighter

Extrusion Process Offered

Mullins Mfg. Corp., Warren and Salem, O., steel stamper, is licensing manufacturers to use its new "Koldflo" process of cold extruding steel.

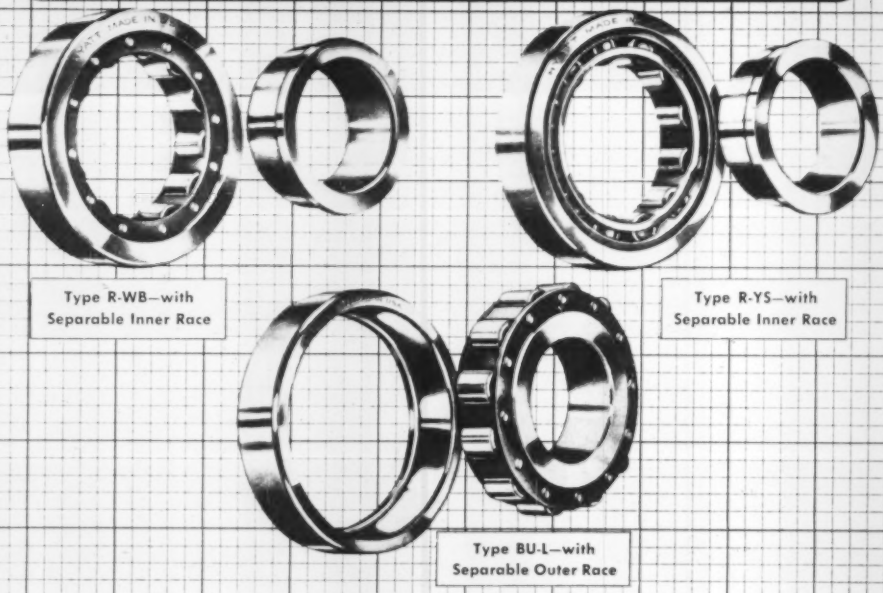
The new process, Mullins says, is cold extrusion plus—plus the ability to extrude commercially on available presses and in combination with other press operations such as drawing, ironing, coining and forging. The new process does not require special surface lubrication and the pressures which are required to make a steel bar flow in the cold state are surprisingly low.

Mullins engineers reveal that one of their discoveries is that they can control the flow of steel under pressure so as to direct it where they want it to go with a minimum of internal and external friction. The ability to do this, they say, disproves the popular concept that tremendous pressures and huge presses are required to do such work. Actually abundant press equipment exists which can be used to cold extrude steel by the Koldflo process.

Mullins first announced its work in the cold extrusion field when it revealed last year it had developed a successful method for cold extruding 105 mm. shells for the ordnance department which recognized the possibility of the need for such process in helping the defense program.

Mullins is building the first plant in the country for mass production of shells by this method. The plant will shortly begin work to fill more than $20 million worth of army and navy contracts.

For Radial Bearings that can Locate Shafts HYATT HY-LOADS



Type R-WB—with Separable Inner Race

Type R-YS—with Separable Inner Race

Type BU-L—with Separable Outer Race

Designed for innumerable applications where the bearing load is primarily radial, Hyatt Hy-Load Roller Bearings can also provide for axial shaft location. When they are used in pairs they can locate the shaft in both directions.

The flanged race construction of the types of Hy-Load Bearings shown here makes this important advantage possible. Other advantages for the designer that are provided in the Hy-Load line are: option of omitted race operation, complete interchangeability of parts, maximum capacity for standard dimensions, ten different types in a wide range of sizes — along with long, trouble-free life.

Full information about Hyatt Hy-Load Roller Bearings is "yours for the asking" in Hyatt Catalog 547. Write today for a copy. Hyatt Bearings Division, General Motors Corporation, Harrison, New Jersey.

HYATT ROLLER BEARINGS

By H. C. TUTTLE *Detroit Editor*

Mirrors of Motordom

Prevalent attitude toward Manly Fleischmann's announcement of automakers working as subcontractors to machine tool builders is: It can't be done just by government edict

DETROIT

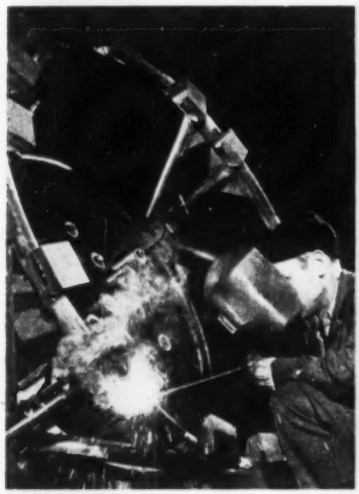
MANLY FLEISCHMANN made it official last week when he said automobile, truck and tractor makers will be put to work as subcontractors to the machine tool industry. Speaking before Detroit's Economic Club on Monday, the NPA administrator announced "a major program to employ the facilities of the automotive industry and related industries in the expansion of the machine tool program." It got under way at a meeting held in Washington four days earlier.

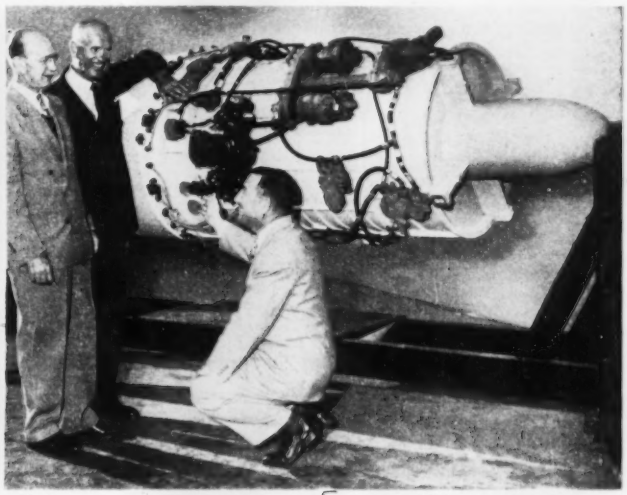
The disclosure was met with a variety of opinions in motordom's capital. The most prevalent attitude: Such a program can't be accomplished by government edict. Long drawn-out negotiations which have been in progress between officials of Fisher Body Division and The Bullard Co. are cited. The GM division is one of a few automotive industry members that could conceivably build complete machine tools. And there is by no means universal agreement that it has the ability and equipment to finish extremely complex mechanisms like Bullard's vertical turret lathes.

The Get-Together — Willingness on the part of automakers to get into machine tool manufacture, even as components parts suppliers, must be met with the same willingness from tool makers to take them on as partners. At the Washington meeting referred to by Manly Fleischmann no members of the machine tool industry were present or invited. But it was attended by luminaries of the auto industry, government agencies and UAW.

On the other side of the fence are these indisputable facts: Automakers are the machine tool builders' best friends. The auto industry aided materially in machine tool subcontracting during the last war. The auto industry even now is doing enough work in its own tool shops to lessen the load on machine tool builders.

Where's the Profit? — Machine tool men privately say automakers will take on subcontracting if it can be made profitable. They point out that their own ceilings prevented them from making deals with price no object. Some go so far as to say materials and labor shortages that they're up against will have to be solved before the auto makers or any other industry can be drawn on as a source of components. Worry about another industry moving into the machine tool bailiwick, some say, is nonsensical. One highly placed tool spokesman told STEEL: "There has been no bitterness from our people over Mr. Fleischmann's working with the auto people to develop a program by which they can co-operate in machine tool subcontracting." But direct dealing





"BETTER NOW THAN LATER": That could well be motordom's slogan when it comes to coping with the challenges of rearmament. Illustrative of its ingenuity are these two photos. At left, a welder in Ford's Dearborn tool and die shop is at work rehabilitating a World War II engine mount for use in Ford's Aircraft Engine Division plant in Chicago. At right, Buick top brass—Edward T. Ragsdale, general manufacturing manager, Ivan L. Wiles, general manager, and Verner P. Mathews, chief engineer—inspect a precision model of the Wright J-65 Sapphire jet engine that the GM division will build. The model was constructed of wood because a production engine was unobtainable; it required 4000 man-hours to build. It is speeding work of Buick engineering, tool design, manufacturing departments

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between the two industries would be preferable, he says. And points out how excellently the two got along in World War II.

That Rehabilitation Job

Much of the rapidity with which automakers have already begun defense materiel production can be traced to their ability at rehabilitating and adapting old machinery to their new jobs. Virtually every auto plant now in war production owes its quick conversion to machinery picked up from government stocks. How important they were was indicated by Kaiser-Frazer's revelation earlier this year that some 1200 tools and equipment were brought into Willow Run from Marietta, Ga., and Omaha.

Ford's tool and die plant at the Rouge is recognized as the largest of its kind in the world. Some of the reconditioning jobs successfully undertaken by it are knocking several months off the time-table of conversion. But the work never shows up on the tool building industry's order boards. Dubbing the machine tools in government storage a "mothball fleet," Ford's specialists are busy "decocooning" them in much the same manner that battleships and guns are removed from their protective coats.

Instances related by Ford showing how it saves time: In three weeks a special lathe was removed from its cocoon, grease cleaned off, the machine rebuilt and redesigned and ready for operation. A new machine, the company says, could not have been delivered, even with the highest government priority, in less than 15 months. A milling machine, put into operation in two weeks, would not have been obtainable for eight months from its builder. Special drill jigs for a boring machine are being manufactured in the plant to enable it to become productive inside of three-four months, compared with eighteen months to obtain a similar new unit. Other automakers are doing exactly the same thing day in and day out.

Copper from Government Stock

Mr. Fleischmann may have left himself wide open to the remark "They don't make any steel in Washington" when he told Detroiters that the industry should get enough material next quarter to permit building 1.1 million passenger cars. He remarked that some of the automakers may not want to build as many units as they are permitted by NPA because of sales difficulties. He threw a little light on the extremely tight copper situation by saying that it may be necessary to take some out of the government's stock pile, and that such a step is under consideration. Purchasing men carefully combing their suppliers see little cause for rejoicing. October and November will be critical months. Biggest crises will be over the copper shortage and cold-finished and forging steel. Until Mr. Fleischmann indicated that withdrawals from the copper pile might be made, the absence of red metal was sure to gnaw at fourth quarter "builds" by the industry.

Auto, Truck Output

U. S. and Canada

	1951	1950
January	645,688	609,879
February	658,918	505,593
March	802,737	610,680
April	680,281	585,705
May	695,898	732,161
June	653,682	897,853
Six Mos.	4,137,204	3,941,878
July	522,853	746,801
August	570,597*	842,335
September		760,847
October		796,010
November		833,784
December		671,622
Week Ended	**1951**	**1950**
Aug. 25	139,115	179,042
Sept. 1	137,479	188,072
Sept. 8	103,224	151,606
Sept. 15	136,452	185,421
Sept. 22	138,000*	188,451

Sources: Automobile Manufacturers Association, Ward's Automotive Reports. *Preliminary.

Boron: Bright Spot in Steel

The steel outlook seems to be brightening, though spottily. Evidence of the hope automakers are pinning on new boron-treated steels was seen in the attendance at the meeting of the SAE Iron & Steel Technical Committee Division VIII. It is probable that new boron steels will be granted tentative AISI standards, and reports will be made on progress by users and producers with the low-alloy products. The committee is finding it desirable to keep prospective users informed of their experience with the new steels. But members admit they don't agree among themselves many times over the suitability of a given steel for a given job and are leary of generalizations.

Recondition Instead of Replace

An indication of the serious concern by automakers over the scarcity of materials is the advice being given to dealers' service departments by one of the Big Three. Covering 18 common repair jobs, a communique advises reconditioning of worn or malfunctioning parts. Brake cylinders, for example, can often be honed instead of replaced. Valves often can be ground or lapped, their seats unless badly worn can be ground.

On many optional items of equipment such as oil filters, motorists are being told they are becoming hard to get. The scare technique is commendably lacking. Throughout the industry more people are soberly trying to assess the impact of the defense program and seem to be sincerely working to spread the message of buying only if the need is there, and not waiting too long to make the decision.

Automatic Shifts: Low Gear

Imposition of percentage limitations on automatic transmission installation in the low and medium price brackets of cars will call a temporary halt to the trend toward their universal use. Carrying an effective date of Oct. 1 this order didn't permit some of the car makers, notably General Motors, room to turn around and get production of manual shifting devices stepped up to meet the higher demand from several divisions currently equipping a higher than allowable percentage of cars with automatic units. The order also was the source of a great deal of anguish among Ford and Borg-Warner people: Their late-coming into automatic transmission manufacture prevented them from increasing production because of aluminum use limitations orders to the levels which the competition enjoyed. The order also calls for an end to use of primary aluminum in pistons.

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New Departure, world's largest producer of ball bearings, takes a natural pride in having contributed 62 years of creative engineering to the industrial development wherein lies our country's strength.

Nothing Rolls Like a Ball...

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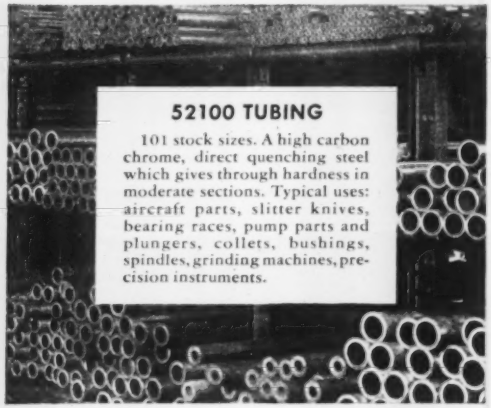
BALL BEARINGS

NEW DEPARTURE • DIVISION OF GENERAL MOTORS • BRISTOL, CONNECTICUT

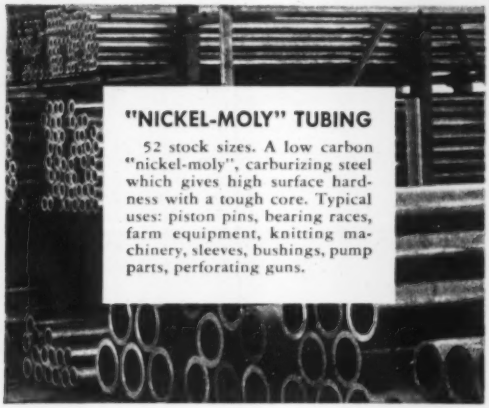
148

Tight steel supply got you in a pinch?



52100 TUBING

101 stock sizes. A high carbon chrome, direct quenching steel which gives through hardness in moderate sections. Typical uses: aircraft parts, slitter knives, bearing races, pump parts and plungers, collets, bushings, spindles, grinding machines, precision instruments.



"NICKEL-MOLY" TUBING

52 stock sizes. A low carbon "nickel-moly", carburizing steel which gives high surface hardness with a tough core. Typical uses: piston pins, bearing races, farm equipment, knitting machinery, sleeves, bushings, pump parts, perforating guns.

These two TIMKEN® steels will do 90% of your hollow parts jobs

and are available now in warehouse lots!

IF rush jobs find you short of steel tubing, get in touch with the Timken Company. The two Timken® steels described above—52100 tubing and "Nickel-moly" tubing—will do 9 out of 10 of your hollow parts jobs. And we guarantee shipment of warehouse lots within 24 hours after receipt of order.

We maintain a mill stock of 101 sizes of 52100 tubing—from 1" to 10½" O.D. This analysis is through-hardening in moderate sections. It can be heat treated to file hardness and tempered back to any point you want. There are 52 stock sizes of "Nickel-moly" tubing—from 1⅜" to 10¼" O.D. With heat treatment, it develops exceptional shock absorbing qualities.

Uniformity in every shipment is assured by the Timken Company's complete, rigid quality control from melting through final inspection. For the current mill stock list, write on your company letterhead to The Timken Roller Bearing Company, Steel and Tube Division, Canton 6, Ohio. Cable address: "TIMROSCO".

YEARS AHEAD—THROUGH EXPERIENCE AND RESEARCH

Specialists in alloy steel—including hot rolled and cold finished alloy steel bars—a complete range of stainless, graphitic and standard tool analyses—and alloy and stainless seamless steel tubing

The Business Trend

Industrial pace quickens as fall production push starts. All components of activity index snap back from holiday letdown

SETTLING into its harness for the fall production pull, industry faces an obstruction-lined road ahead.

Not all obstacles stem from rearmament, though emphasis on the military is becoming increasingly apparent. Back of the manufacturing barriers are disinterested consumers, reluctant to buy. Materials scarcities will plague production men for a long time to come. Screws are being tightened on all manner of consumer goods; more restrictions are promised for the first quarter. Tooling stages are past for many weapons producers, but conversions will continue, taking away valuable production time. These all add up to output cuts, direct or indirect.

Despite these problems, this fall will be a busy one for industry. Since July's tailspin, production has made a decisive reversal in direction. August industrial production, measured by the Federal Reserve Board's index at 218 per cent of the 1935-1939 average, jumped over half-way back to the June level. Significant in that reading is that manufacture of durable and nondurable goods both shared in the comeback, while minerals production rose proportionately. September is almost certain to show a further rise in the FRB index, and it should mark its 1951 high before the year is out.

Supporting the theory of industrial acceleration is STEEL's activity index. In the week ended Sept. 15 it rebounded to 217 per cent of the 1936-1939 average from its mark of 198 in the Labor Day week. All components showed substantial gains.

Five Million Autos in '51 . . .

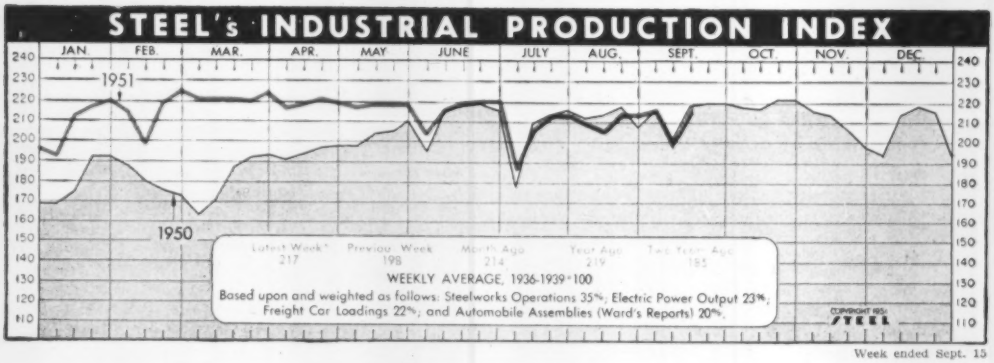
Back at five-day NPA-authorized production levels, car and truck producers' assembly totals compared favorably with those for the last week in August. U. S. and Canadian plants counted 136,452 auto and truck completions in the week ended Sept. 15. Only 103,224 units were put out in the prior four-day operating period. Outlook for October builds has improved, says *Ward's Automotive Reports*, but few passenger car makers are confident of sufficient raw materials inventories in oncoming weeks. *Ward's* predicted passenger car production this year will reach more than 5 million units, a mark exceeded only by 1950 and 1949 totals. If full NPA quotas were met by all producers, volume could reach 5,360,000. NPA has told automakers that enough materials should be available in the fourth quarter to make just about the 1.1 million cars alloted the industry for that period. Passenger car output next year may be limited to a little over half the 1950 turnout of 6,672,141 units, NPA hinted.

Steel Pouring Rises . . .

Doing their part to boost production, the nation's steel mills were scheduled to turn out 2,023,000 net tons of ingots and steel for castings in the week ended Sept. 15. This would be 24,000 tons over the preceding week's output and 87,000 tons more than the year before. Another long period of above-capacity opera-

BAROMETERS of BUSINESS

		LATEST PERIOD*	PRIOR WEEK	MONTH AGO	YEAR AGO
INDUSTRY	Steel Ingot Output (per cent of capacity)†	100.0	99.0	102.0	101.0
	Electric Power Distributed (million kilowatt hours)	7,138	6,795	7,164	6,449
	Bituminous Coal Production (daily av.—1000 tons)	1,560	1,756	1,696	1,695
	Petroleum Production (daily av.—1000 bbl.)	6,320	6,278	6,240	5,938
	Construction Volume (ENR—Unit $1,000,000)	$189.2	$160.5	$214.9	$219.7
	Automobile and Truck Output (Ward's—number units)	136,452	103,224	129,661	185,421
	*Dates on request. †Weekly capacities, net tons: 1951, 1,999,035; 1st half 1950, 1,906,268; 2nd half 1950, 1,928,721.				
TRADE	Freight Car Loadings (unit—1000 cars)	835†	733	829	866
	Business Failures (Dun & Bradstreet, number)	164	116	158	165
	Currency in Circulation (in millions of dollars)‡	$28,216	$28,262	$27,925	$27,151
	Department Store Sales (changes from like wk. a yr. ago)‡	−2%	−2%	−8%	+8%
	†Preliminary. ‡Federal Reserve Board.				
FINANCE	Bank Clearings (Dun & Bradstreet—millions)	$14,951	$12,043	$14,687	$15,064
	Federal Gross Debt (billions)	$256.6	$256.8	$255.9	$258.1
	Bond Volume, NYSE (millions)	$16.4	$12.4	$12.3	$22.7
	Stocks Sales, NYSE (thousands of shares)	10,929	7,453	7,215	10,890
	Loans and Investments (billions)†	$70.4	$70.5	$70.0	$68.5
	United States Gov't. Obligations Held (millions)†	$30,752	$30,930	$30,920	$34,698
	†Member banks, Federal Reserve System.				
PRICES	STEEL's Weighted Finished Steel Price Index††	171.92	171.92	171.92	156.99
	STEEL's Nonferrous Metal Price Index‡	224.6	224.6	224.6	217.1
	All Commodities†	176.8	176.8	177.2	169.7
	Metals and Metal Products†	188.2	188.2	188.1	177.1
	†Bureau of Labor Statistics Index, 1926=100. ‡1936-1939=100. ††1935-1939=100.				


STEEL's INDUSTRIAL PRODUCTION INDEX
JAN. FEB. MAR. APR. MAY JUNE JULY AUG. SEPT. OCT. NOV. DEC.
1951
1950
Latest Week* 217
Previous Week 198
Month Ago 214
Year Ago 219
Two Years Ago 185
WEEKLY AVERAGE, 1936-1939=100
Based upon and weighted as follows: Steelworks Operations 35%; Electric Power Output 23%; Freight Car Loadings 22%; and Automobile Assemblies (Ward's Reports) 20%.
COPYRIGHT 1951 STEEL

Week ended Sept. 15

tions would help ease supply of steel, but wouldn't cure the shortage.

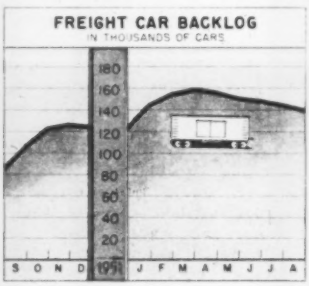
Power Expansion Threatened . . .

Delays in manufacture of new equipment due to metals shortages could reduce the electric power industry's expansion of generation capacity as much as 8 million kilowatts by the end of next year. That's the opinion of George M. Gadsby, president of Edison Electric Institute. He warned that slippage in scheduled installation of new capacity will amount to at least 4 million kilowatts and that it could go to twice that amount. The deficiency below expansion goals will be only about 500,000 kilowatts by the end of this year since most equipment for delivery in 1951 was well into production before shortages intervened. Supply is still ahead of demand, but needs of industry should mount steadily this fall. Weekly distribution has been breaking the 7 billion kilowatt-hour mark since mid-August. In the week ended Sept. 15, output was 7138 million kilowatt-hours.

One Million Home Starts?

Applications for new residential and commercial building are getting rough treatment by NPA. The agency has turned down five applications for permission to start new construction for every one it has approved during the last three months. Shortage of structural steel was the main reason for the refusals.

Bureau of Labor Statistics predicts more than 1 million new houses will be built this year, far above the government goal of 850,000. The prediction is based on reports for the first eight months showing 758,500 houses started—higher than any year except 1950. Relaxation of credit restrictions will boost starts the rest of the year, BLS says. In August there were 85,000 new nonfarm dwellings started, 1000 less than July. The

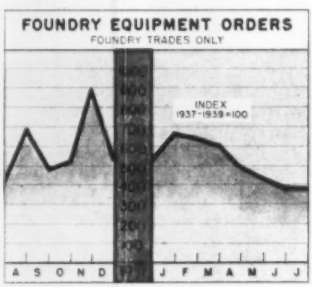


Freight Car Awards and Backlogs

	Awards		Backlogs*	
	1951	1950	1951	1950
Jan.	26,356	9,376	144,758	19,026
Feb.	15,947	9,065	154,861	26,055
Mar.	11,271	6,201	158,619	30,539
Apr.	6,628	3,298	155,871	32,857
May	4,919	11,636	150,628	42,309
June	6,793	2,095	147,725	40,585
July	2,417	30,065	144,810	67,084
Aug.	1,828	23,850	139,014	86,156
Sept.	.....	25,111	.....	106,611
Oct.	.....	21,886	.....	122,148
Nov.	.....	10,573	.....	126,570
Dec.	.....	3,326	.....	124,489
Total	.....	156,482		

* End of month

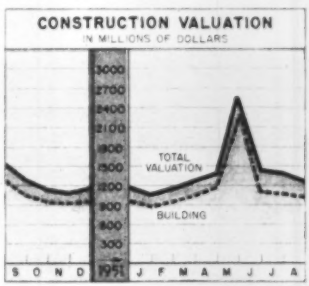
American Railway Car Institute.



Foundry Equipment

	Index		Value in Thousands	
	1951	1950	1951	1950
Jan.	668.0	159.3	$3,075	$731
Feb.	638.6	113.1	2,940	519
Mar.	599.0	225.2	2,758	1,034
Apr.	490.1	160.6	2,256	737
May	431.7	294.9	1,987	1,353
June	393.2	622.7	1,810	2,858
July	330.3	401.8	1,797	1,844
Aug.	.....	693.6	.....	3,183
Sept.	.....	483.8	.....	2,220
Oct.	.....	526.8	.....	2,417
Nov.	.....	885.5	.....	4,077
Dec.	.....	526.2	.....	2,412

Foundry Equipment Mfrs. Assoc.



Construction Valuation

(37 States)—In Millions of Dollars

	Total		Building	
	1951	1950	1951	1950
Jan.	1,043.2	730.9	881.9	578.8
Feb.	1,140.5	779.5	962.3	627.0
Mar.	1,267.4	1,300.2	1,043.8	1,075.3
Apr.	1,375.0	1,350.5	1,108.9	1,123.5
May	2,573.0	1,347.6	2,295.0	1,083.0
June	1,408.9	1,345.5	1,098.4	1,072.0
July	1,379.8	1,420.0	1,084.7	1,162.2
Aug.	1,262.8	1,548.9	1,043.5	1,295.1
Sept.	.....	1,286.5	.....	1,048.3
Oct.	.....	1,135.8	.....	956.7
Nov.	.....	1,087.1	.....	931.6
Dec.	.....	1,169.4	.....	969.0
Total	.....	14,591.1	.....	11,922.5

F. W. Dodge Corp.

Charts—Copyright 1951, STEEL

drop was in public units; private starts increased about 3 per cent in the month to 84,600.

Everybody Working . . .

A new postwar high was set in August for nonagricultural employment: 54.9 million held jobs then. But the increase from July was less than in any August since 1945. Agricultural employment declined seasonally in the month. Unemployment fell to slightly over 1.5 million—lowest level reached in any month since the war. Industrial workers are harder to find too. Bureau of Employment Security says occupational shortages have about tripled over the past year, rising from 21,896 in August, 1950 to 63,325 in August of this year.

Brakes on Inventories . . .

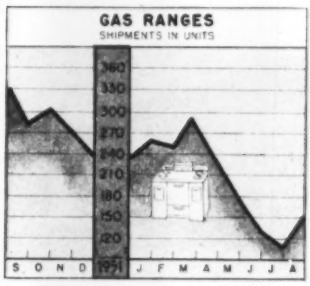
Business inventories are tending to level out finally, the Office of Business Economics reports. Book values increased only $200 million during July, compared to a $600 million rise in June and continuous increases ranging from $1.3 billion to more than $2 billion in each of the previous ten months. OBE thinks the lessening is caused by adjustment of manufacturing output—and of distributor's purchasing—to softening of consumer demand as well as the effect of recent easing of prices on inventory valuation. Total inventories going into August were estimated at $69.5 billion.

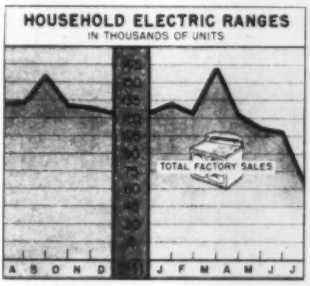
Trends Fore and Aft . . .

Physical volume of the nation's output has risen 80 per cent since 1939 after allowance for price changes . . . Wholesale prices remained static in the week ended Sept. 11 . . . Fourth-quarter freight car loadings are expected to be about 3 per cent higher than last year . . . Coal producers are sighting a 40-50 million ton market in Europe if shipping becomes available . . . Backlog of the Budd Co.'s defense orders is over $62 million . . . Nickel shortages are cutting into receiving tube production .

Issue Dates of other FACTS and FIGURES Published by STEEL:

Durable Goods ——Aug.6	Indus. Production . July23	Refrigerators Aug.6
Employ., Metalwk. July16	Ironers Sept.17	Steel Castings Sept.10
Employ., Steel Aug.27	Machine Tools Sept.10	Steel Forgings Aug.20
Fab. Struc. Steel..Sept.10	Malleable Castings..Sept.10	Steel Shipments ...Aug.27
Furnaces, Indus. ..Sept.17	Prices Aug.27	Vacuum Cleaners ..Sept.3
Furnaces, W. Air ..Sept.17	Pumps, New Orders July9	Wages, Metalwkg. Aug.13
Gear Sales Sept.17	Purchasing Power..Sept.3	Washers Sept.17
Gray Iron Castings Sept.10	Radio, TV Aug.20	Water Heaters Sept.3





Gas Ranges

Shipments in Units

	1951	1950	1949
Jan.	260,600	165,000	106,700
Feb.	254,000	209,000	117,700
Mar.	289,800	264,000	151,500
Apr.	225,000	239,100	150,100
May	177,800	242,800	151,600
June	128,500	217,000	162,200
July	106,500	254,800	125,800
Aug.	151,500	331,500	206,100
Sept.	.....	287,000	227,300
Oct.	.....	308,000	257,500
Nov.	.....	269,100	237,400
Dec.	.....	235,900	175,700
Total	.....	3,023,200	2,069,600

Gas Appliance Mfrs. Assoc.

Household Electric Ranges

Total Factory Sales—Units

	1951	1950	1949
Jan.	132,437	97,925	109,919
Feb.	123,953	118,989	88,333
Mar.	162,267	145,417	88,934
Apr.	122,803	132,859	60,739
May	109,572	145,498	52,881
June	107,861	158,534	69,107
July	62,690	130,505	63,249
Aug.	.....	132,243	66,753
Sept.	.....	156,216	93,045
Oct.	.....	130,452	73,312
Nov.	.....	129,384	60,523
Dec.	.....	124,360	77,011
Total	.....	1,602,382	903,806

National Electrical Mfrs. Assoc.

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HI-TEMP OILS

and be sure!

• Hit-or-miss hot spot lubrication is costly . . . and unnecessary. You can't afford to guess about oils that must lubricate within the critical 300-500 F. range!

We know . . . because we made extensive on-the-job tests for two years to find which oils are best for various high temperature applications.

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And for actual Hi-Temp test results with proper application data, write E.F. Houghton & Co., Philadelphia 33, Pa.

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PHILADELPHIA · CHICAGO · DETROIT · SAN FRANCISCO

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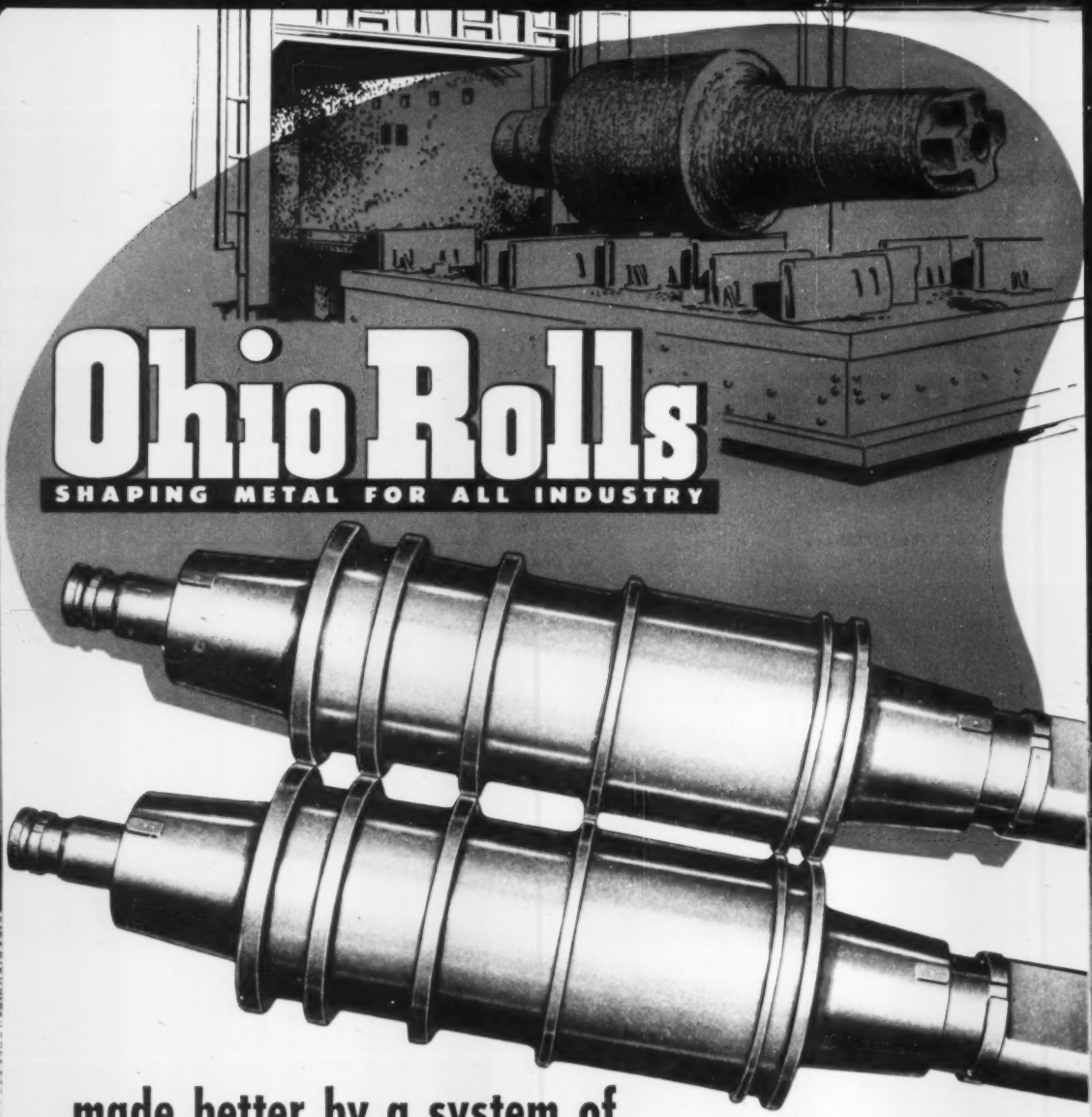

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made better by a system of INTEGRATED PROCESS CONTROL

Select from any of these eleven types of Ohio Steel and Iron Rolls:

Carbon Steel Rolls	Denso Iron Rolls
Ohioloy Rolls	Nickel Grain Rolls
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Holl-O-Cast Rolls	Nioloy Rolls
Chilled Iron Rolls	Flintuff Rolls

Alloy Chilled Iron Rolls

Unique in roll manufacturing is Ohio Steel's Integrated Process Control. The same team of specialists is responsible for quality from receipt to shipment of your order. This group of metallurgists, chemists, engineers and inspectors establishes standard practice procedures and testing requirements for every department. So highest quality is maintained.

THE OHIO STEEL FOUNDRY CO. LIMA, OHIO

PLANTS AT LIMA AND SPRINGFIELD, OHIO

Men of Industry

KENNETH G. HUBACH
. . . heads Baldwin's new department

Baldwin-Lima-Hamilton Corp., Eddystone, Pa., appointed **Kenneth G. Hubach** as manager of its newly created commercial weldment department. He joined Page Steel & Wire Division, American Chain & Cable Corp., in 1936 as a welding engineer. In 1942 he became general manager of Standard Electrode & Mfg. Co., and in 1951 joined H. L. Yoh Co. as chief engineer on a special overseas government project.

Four new vice presidents elected by **Allis-Chalmers Mfg. Co.,** Milwaukee, include: **W. G. Scholl,** vice president in charge of sales, tractor division; **C. W. Schweers,** vice president in charge of sales, general machinery division; **J. F. Roberts,** vice president in charge of engineering, general machinery division; and **W. A. Yost,** a vice president of the general machinery division. **G. F. Langenohl,** assistant treasurer, was elected treasurer and appointed assistant secretary. **N. D. Johnson,** assistant secretary, will continue to serve in that capacity and assumes additional responsibilities as assistant treasurer.

Paul W. Arnold was promoted to the newly created post of executive assistant to the sales vice president of **Reliance Electric & Engineering Co.,** Cleveland. He has served as manager of product sales for the last several years. **Richard A. Geuder,** who since 1944 headed the company's application engineering work, becomes manager of a new department of applied engineering and industry sales, the latter representing a consolidation of other specialized activities including contract sales, federal and marine sales, and general industry applications.

EADS JOHNSON JR.
. . . exec. V. P., Southern Wheel Div.

Eads Johnson Jr. was appointed executive vice president, Southern Wheel Division, **American Brake Shoe Co.,** New York. He was assistant vice president. Mr. Johnson entered sales work for the company's Brake Shoe & Castings Division in 1935, and in 1949 he transferred to the sales department of the Southern Wheel Division.

Frank P. Minnelli was appointed manager of a newly organized market research department of **Yale & Towne Mfg. Co.,** Philadelphia division. Before joining Yale & Towne he was assistant to Elmo Roper, marketing consultant, and previously was in the research department of a New York firm of advertising and merchandising consultants.

H. A. Ferris was named manager of the newly formed western division of **Canadian Aviation Electronics Ltd.,** at Winnipeg, Man., Canada. Associated with the radio industry since 1929, he was chief engineer for the RCAF section, National Research Council, radar division, from 1941 to 1946. He then joined TCA as technical assistant director of communications, and was appointed technical adviser to the Canadian Delegation of ICAO. In 1949 he resigned that position to become vice president and chief engineer of Halross Instruments Corp., Winnipeg.

Dow Chemical Co., Midland, Mich., named **J. P. Doan** superintendent of extrusion operations, magnesium department, Madison Division. **John M. Henske** was named assistant superintendent of the magnesium department rolling mill.

W. C. NEWBERG
. . . new president of Dodge

W. C. Newberg was named president of the **Dodge Division** of Chrysler Corp., Detroit. He takes over the post **L. L. Colbert** has held since his elevation to the corporation's presidency last year. Mr. Newberg has been vice president of Dodge since 1950 and prior to that was president of the company's Airtemp Division. Other promotions within the corporation include **L. J. Purdy** as vice president and general manager of trucks at Dodge, and **E. C. Quinn,** formerly general sales manager at Dodge, elected vice president and general manager. **Chrysler Division. Ernest C. Dock** was named general sales manager, Dodge Division, and **K. C. Deacon,** operating manager, Dodge truck plant. **Frank W. Rickard** will be general superintendent of the Michaud Ordnance plant at New Orleans where Chrysler will produce tank engines.

John F. Kurt, Cleveland district sales engineer, **Tinnerman Products Inc.,** was promoted to manager of the Chicago midwest district office.

Appointments in the purchasing section of **General Electric Co.'s** materials and purchasing department, Schenectady, N. Y., include: **Vincent P. Gregg,** named manager of purchasing of nonferrous materials; **Bruce H. Bradbeer,** manager of purchasing of ferrous materials; and **Herbert L. Schnell,** manager of purchasing of factory equipment and subcontracting.

Bertram M. Helfaer was promoted from superintendent of research laboratories to research manager of the Buffalo plant of **National Aniline Di-**

vision, Allied Chemical & Dye Corp.

Arthur J. Wieland, general manager of **Ford Motor Co.'s** International Di-

ARTHUR J. WIELAND
. . . a V. P., Ford's Intern'tl Div.

vision, was elected a vice president. He joined Ford in 1949 as general manager of the division. He is a member of the company's administration committee and is chairman of the foreign operations committee. Previously, he had been executive vice president of Willys-Overland Motors Inc., and vice president and sales manager of General Motors Corp.-overseas operations.

S. A. Angotti was appointed assistant secretary for **Landis Tool Co.,** Waynesboro, Pa. He was formerly director of industrial relations at Fairchild Aircraft Division, Hagerstown, Md.

Appointments in the metallurgical and inspection department, **Fairless Works,** Morrisville, Pa., U. S. Steel Co., include: **H. F. Pietsch** as assistant chief metallurgist and inspector; **H. J. Wolthorn,** chief chemist; **J. O. Mack,** chief control and development metallurgist; **D. T. Goettge,** chief sheet mill metallurgist and inspector; and **R. V. Cordingley,** chief tin mill metallurgist and inspector.

Bruce W. Nichols, building specialties sales department, Chicago office, **Bethlehem Steel Co.,** is retiring Oct. 1 after having completed 33 years of service.

A. G. Ruediger, formerly of Airtemp Division, Chrysler Corp., has resigned as president of the Dayton, O., **Purchasing Agents Association.** He recently joined Carrier Corp. as director of procurement, and will be located in Syracuse, N. Y.

Nels Grashaw and **Jack Urban** were appointed sales engineers by **Harvey Tool Service,** Cleveland distributor of Modco metal cutting tools. They will handle sales and distribution in northeastern and southwestern Ohio, respectively.

Dr. D. John Lauer was appointed medical director, **Jones & Laughlin Steel Corp.,** Pittsburgh.

Ben Mack, power tool engineer, has joined **Rayhaven Equipment Co.,** Detroit, to head its newly created machine and tool division which will specialize in portable power tools for construction and industrial uses. Mr. Mack was with Mall Tool Co. as Detroit district sales manager.

James R. Elsinger, representative, was transferred from Atlanta to the Baltimore district of **Signode Steel Strapping Co.,** Chicago.

Daco Machine & Tool Co., Brooklyn,

FREDERICK NUESKE
. . . Daco master mechanic-tooling

N. Y., appointed **Frederick Nueske** as master mechanic in charge of tooling of Daco precision instruments. A 10-year veteran production counselor, he is the former owner of Nueske Machine & Tool Co., Long Island City, N. Y.

F. P. Spence, former Pacific Division manager, **Diversey Corp.,** Chicago, was promoted to regional sales manager, a newly created post. He continues to exercise overall supervision of the Pacific Division sales inasmuch as the division is part of the sales region he now heads. **R. C. Perry** replaces Mr. Spence as Pacific Division manager.

Francis M. Hernan has joined **Fruehauf Trailer Co.** as assistant controller in charge of plant accounting at Detroit. He was budget director of Anchor Hocking Glass Corp. for six years, and prior to that was assistant controller of Weatherhead Co.

The electronics and x-ray division, **Westinghouse Electric Corp.,** appointed **Coleman London** manager of electronics service. He will direct activities of a national and overseas field service organization for military and commercial electronics equipment manufactured at the division's plant in Baltimore.

H. Gordon Smith, vice president and general manager, textile division, was named to the newly created post of executive vice president, **U. S. Rubber Co.,** New York. **William E. Clark** was elected a vice president and made general manager of the division. The positions will be assumed Oct. 1.

A. S. Martin, president of **King Fifth Wheel Co.,** Philadelphia, has returned to military service. **N. O. Berggren,** sales representative for King in the New York-New England area, was appointed executive vice president during Lieutenant Colonel Martin's army tenure.

William Croysdale, assistant to manager of production department, metal products division, **Koppers Co. Inc.,** since last May, was named manager of the Bartlett-Hayward plant of the division in Baltimore.

Fortune P. Ryan was elected president and a director of **Royal Typewriter Co.,** New York.

David Round & Son, Cleveland, manufacturer of hoisting equipment, appointed **D. R. Hulme** purchasing agent. He will be located in the gen-

D. R. HULME
. . . David Round purchasing agent

eral offices of the new David Round plant in Solon, O.

C. W. Miller was named manager of

ROUND AND SHAPED TUBING

.010" to 5/8" O.D. Max.
Certain Analyses .035" max. wall to 1 3/8" O.D.
Available in:

Carbon Steels:
A.I.S.I.—C-1008, MT-1010, MT-1015, C-1118, MT-1020, C-1025, C-1035, E-1095

Alloy Steels:
A.I.S.I.—4130, 4132, 4140, 4150, 8630, E-52100

Stainless Steels:
A.I.S.I.—303, 304, 305, 309, 310, 316, 317, 321, 347, 403, 410, 420, 430, 446, T-5

Nickel Alloys:
Nickel, "D Nickel"*, "L Nickel"*, "Monel"*, "K Monel"*, "Inconel"*, 30% Cupro Nickel, 18% Nickel Silver.

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Chapter 4

Putting the Squeeze on Tubing —to End Bends!

Whether you use fine small tubing as a medium for transporting fluids or gases—or fabricate it into component parts—you want it straight as an arrow to start. That's where the machine pictured above comes in.

Commercial straightness is easily attained with Superior's numerous types of specialized straightening equipment.

In the normal course of tube drawing operations, unequal stresses are set up and the resultant tube has bends and bows which must be removed.

All these stresses are equalized in one operation. The tube is straightened and the end result is a better product for you.

To produce the world's best tubing we inspect and check many times, mechanically and metallurgically. We use microscopes to check grain structure, and keen-eyed inspectors to detect surface scratches, splits and pits. Pressure tests find any possible flaws in the walls. A continuing program keeps every Superior production worker aware of his part in the quality picture.

What does this mean to you?

It means you get fine small tubing that will do the toughest jobs better. Right now (because of Defense Orders and metal shortages) we may not be able to fill all of your tubing requirements, but it will pay you to check with your Superior distributor—he may have enough tubing in stock to help you. Always specify Superior Tubing and you'll always be right.

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Certain analyses (.035" max. wall)
Up to 1 3/8" O.D.

ARTHUR I. GIBSON
. . . heads div., U. S. Steel Supply

DON BALFOUR
. . . Texas Eng. & Mfg. factory mgr.

ALBERT E. SALATKA
. . . Marion Malleable Iron works mgr.

large power transformer engineering for the transformer division of **Westinghouse Electric Corp.** at Sharon, Pa. He succeeds the late **W. G. James.**

Arthur I. Gibson was appointed manager of the newly formed sheet and strip division, general sales department, **United States Steel Supply Co.,** Chicago, subsidiary, U. S. Steel Corp. He has been product representative of U. S. Steel Co.'s sheet and strip division in Pittsburgh.

Howard M. Daschbach was appointed general traffic manager of **Consolidated Western Steel Corp.,** Los Angeles, subsidiary of U. S. Steel Corp. He continues as general traffic manager of two other subsidiaries, Columbia Steel Co., San Francisco, and Geneva Steel Co. of Utah. Mr. Daschbach will continue headquarters at San Francisco.

Glen Luepold was appointed works manager of Plant No. 3 of **Heil Co.,** Milwaukee. Formerly with A. O. Smith Corp., he succeeds **Roy Barbian,** resigned.

G. A. Kraatz was appointed sales manager, plastic molding department, **Wheeling Stamping Co.,** Wheeling, W. Va.

R. M. Kelday, assistant to the president, **Steel Co. of Canada Ltd.,** Hamilton, Ont., was appointed manager of wire, wire products and screw division. He assumes duties of the newly created position Oct. 1.

Don Balfour, former works manager at the Nashville Division of Consolidated Vultee Aircraft Corp. during World War II, and more recently plant superintendent for Avco Mfg. Co. at Nashville, will take over the position of factory manager at **Texas Engineering & Mfg. Co.,** Dallas, effective Sept. 28. He will succeed **O. E. Witbeck,** resigning to go into business for himself.

Oliver Iron & Steel Corp., Pittsburgh, has opened executive and sales offices of its Berry Division at 429 Fourth Ave. The sales office is under direction of **John R. Carlson,** general manager of sales, Berry Division. **Ara A. Cambere,** Oliver vice president in charge of the Berry Division, will have offices at the new address.

Men who will head production at the new **Westinghouse Electric Corp.** plant in Columbus, O., now under construction and expected to be completed by early 1953, are: **C. L. Van Derau** who becomes general works manager in charge of both the Mansfield, O., and Columbus plants; **E. L. Smith,** works manager; **C. D. Heaton,** manager of manufacturing; and **John B. Roman,** works engineer.

Douglas Tool Co., Detroit, elected **Llewellyn A. Curnoe** secretary-treasurer and a director. He has been serving as secretary.

Bissett Steel Co., Cleveland, elected **Clarence F. Fitzgerald** treasurer. He has been chief accountant.

Albert E. Salatka was appointed works manager of **Marion Malleable Iron Works,** Marion, Ind., subsidiary of Chicago Railway Equipment Co. He is succeeded as general superintendent by **Herbert F. Miller.**

Ned Root was named manager of public relations by **Consolidated Vultee Aircraft Corp.,** San Diego, Calif. **N. W. Bouley** was named assistant chief engineer to succeed **C. R. Irvine,** appointed assistant division manager and chief engineer, Convair guided missile division.

Ralph S. Cadwallader was named sales promotion manager, **Perfection Stove Co.,** Cleveland. He joined the company in 1946 and has spent the last few years as western territory salesman.

R. J. Malloy was appointed assistant sales promotion manager, **Nash Motors Division,** Nash-Kelvinator Corp., Detroit.

Kaiser Aluminum & Chemical Sales Inc., Oakland, Calif., appointed **John Menz** general sales manager-direct sales; **Ray G. Boyd,** general product sales manager; **G. P. Oldham,** general marketing manager; and **J. W. Watson Jr.,** West Coast manager.

Dennis Ord has joined **Sam Tour & Co. Inc.,** New York. He will be located in the research and development laboratories in New York where he will specialize in chemical analysis of titanium and titanium alloys.

OBITUARIES . . .

Anthony W. Froman, 71, president, **Manufacturers Tool & Die Co.,** Rochester, N. Y., died Sept. 9.

Louis A. Gilmer, 48, chief engineer, wheel tractor plant, **Oliver Corp.,** Charles City, Iowa, died Sept. 6. He joined Oliver in 1934.

B. C. Edkin, former president, **Erie Bronze Co.,** Erie, Pa., died Sept. 9. He headed the firm until 1945 when he sold the business and retired.

Harry W. Benton, 67, plant engineer, **Niles-Bement-Pond Co.,** West Hartford, Conn., died Sept. 10 in the Red Wing, Minn., Hospital after an automobile accident.

Frank J. Roderick, 64, president, **Safeguard International,** Philadelphia, business machine manufacturing firm, died Sept. 12.

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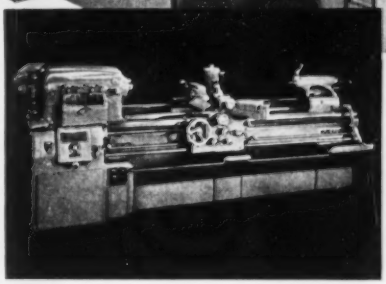
With Monarch Tracer Controls

Increased output within your present plant limitations is the quickest answer to today's demands—increased output as provided by Monarch tracer-controlled single point turning. Most new Monarch lathes can be equipped with one of the *three* types of Monarch tracer controls best suited to get this result.

Look at these actual job records! On a rotary grinder casing formerly turned on a turret lathe—*machining time cut* from over 22 minutes to 6. On a rear wheel spindle, formerly produced in over 2½ minutes on 2 machines (one roughing and one finishing)—*machining time cut* to 24 seconds on a single Mona-Matic. On an aircraft engine mount, *machining time cut* from 47 minutes to 20 minutes, with 6 separate operations eliminated and accuracy and finish improved. On a 120" printing press roll, *turning time cut* from 7½ hours to 1½ hours.

You'll notice that we're talking increased output. Isn't the decreased cost obvious? And isn't this the equivalent of adding to your floor space? You can read all these into your production figures. Bear in mind that with the easily set up tracer controlled principle, you can realize all three advantages on short runs as well as long ones.

This is certainly the time to investigate production improvements like these. We'll gladly answer your inquiry with complete data, job facts, descriptions . . . *The Monarch Machine Tool Co., Sidney, Ohio.*



Monarch Series 60 Engine Lathe with Air-Gage Tracer Controls. For turning multiple diameter shafts and turning, boring or facing contours. Available with or without fully automatic cycle. Monarch has built fine lathes since 1909—3 types of tracer controls beginning in 1930.

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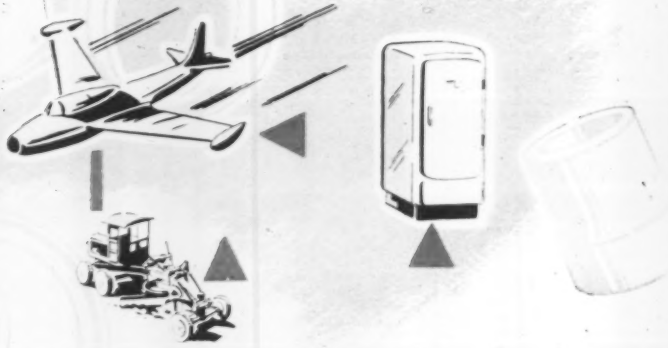

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EXTRUDE POWDER MIXTURES— Magnesium alloys can be formed by a metallic powder compressing process, rather than by the conventional melting method, according to an Air Force research report. The process involves mixing atomized magnesium powder with powders of the alloying metals and extruding the mixture. The method is claimed to give alloys with higher strength than the same compositions which have been extruded from billets and to make possible new alloy compositions not obtainable by melting and casting.

PAY PRICE FOR ACID RECOVERY?— Sulphuric acid recovery process for application to pickling wastes involves separation of the iron sulphate by crystallization, after concentrating the liquor by submerged combustion in a special burner in which oil flames blaze beneath the surface of the liquid. Sulphate is filtered out of the liquid on a plastic filter supported by a lead frame, then mixed with coal and roasted to produce sulphur dioxide gas, easily converted back to sulphuric acid. Iron oxide can be returned to the blast furnace. Equipment investment is rather high, as is the cost of fuel for water evaporation. Consult Chemical Construction Corp., New York, for details.

PHOTOSENSITIVE ALUMINUM— A process for printing from photographic negatives on sensitized thin-gage aluminum sheet, originating in Switzerland, is now under development in the U.S. Reproductions on aluminum have a high degree of permanency and are unaffected by atomic radiation. Possible uses include instrument scales, nameplates, maps, plant badges. Refinement of the technique may permit printing in color where this is desired.

STANDARDS MEAN PROFITS— Initiation and use of standards is not an easy process and particularly in the case of the smaller company may be dismissed as so much folderol. A wise top management will recognize the very real profit possibilities in standardization, both of product and process, and will give its standards engineers full rein to think and plan. It may cost money but the investment properly handled will pay dividends in lower costs and improved efficiency. —p. 94

THEORY OF ABRASIVE WEAR— Wear of the abrasive cutting points of a grinding wheel which leads to glazing is known as "attritious" wear. It depends not only upon the relative hardness of abrasive and work but also upon chemical correlation between the two. Wear is believed to be affected, for example, by the solubility of the specific abrasive in the work material. Aluminum oxide and silicon carbide are both much harder than glass; yet the aluminous abrasive has much more rapid point wear on glass. On hard steel the order of wear is reversed and silicon carbide dulls more rapidly than aluminum oxide even though it is harder. Lubricant or coolant at the abrasive-work contact has marked effect upon the rate of attritious wear of the abrasive.

CRYSTALS ACTUATE CLUTCH— An experimental high-speed crystal clutch recently developed at the National Bureau of Standards is believed to be the first of its type. In the design, application of a direct-current voltage to the electrodes of three "Bimorph" piezoelectric crystal elements causes bending of the elements; this bending presses the clutch output disk against the rotating input disk. Distinguishing features are high speed of response (on the order of 0.2 millisecond) and almost negligible current drain. No current flows, other than insulation leakage, after the applied voltage has charged the capacity of the crystals. The unit was developed for use in high-speed computers and, with its immediate mounting, occupies space about 6 inches in diameter and a little over an inch in length.

USE O_2-CO_2 IN BESSEMER BLOW— Nitrogen content of basic bessemer steel can be reduced to 0.005-0.006 per cent by replacing air with a mixture of equal parts of oxygen and carbon dioxide during the dephosphorizing period, or just after the drop of the flame, according to Swedish experiments. Other advantages include shorter blowing times, reduced air quantity and the possibility of melting more scrap and ore. Also, pouring temperatures may be kept higher without any risk of increased absorption of nitrogen.

BRAINS IN MACHINES— Speed and precision are factors which are becoming "musts" in production of modern jet aircraft. Special machines have been developed to do the job and much credit goes to the equipment builders for incorporating advanced ideas for the shaping of metal in unconventional form. It is no easy job to make a machine tool which will do a "sculpturing" operation on aluminum shapes; yet that is exactly what some of the latest machine adaptations do. —p. 98

OFF THE CUFF: Wrinkles in aluminum stampings are minimized by specially developed clips mounted on the edges of sheet metal blanks prior to forming operations (p. 101) . . . Washing cylinder head castings before machining operations is a worthwhile investment from the standpoint of saving on broken cutting tools (p. 102) . . . A "pint-size" heat treating unit does a neat job of hardening a wide variety of small parts (p. 110) . . . Plastic-surfaced plywood is paying its way as matchboard material in a large nonferrous foundry (p. 108) . . . Australia is comforting source for tungsten, with sizable deposits of wolframite and scheelite being worked there now for export to the U.S. —A.H.A.

Metalworking Outlook—p. 57 *Market Outlook—p. 143*

STANDARDIZATION . . . *Key to*

Effective organization and operation of a company standards department can transform standardization from an academic term to a prime money-saving, product-improving production factor

THE STANDARDS organization of a medium-sized Connecticut machine shop is a single desk tucked away in a corner of the firm's drafting room. It occupies an equally inconspicuous spot on the company's organizational chart. Yet, like the far more complex standards departments at RCA Victor, Westinghouse and Du Pont, it more than pays its own way.

As a missionary dedicated to spreading the gospel of industrial standardization, it

—formalizes the answers to plant problems already solved and frees creative energies for those needing solution.

—reduces inventory and the cost of its control, eases production burdens, cuts needless complexity in engineering and design—briefly, it contributes to lower operating costs and greater profits.

—leads to improved quality of raw materials, components and finished product.

—offers a sensible means for enjoying fully the benefits of national standards and for modifying these standards in accordance with unique company needs.

—develops procurement standards, testing specifications, simplified practices—all aimed at solving plant problems which are not provided for in national standards.

Administrative Job—Company standardization is an administrative not a creative undertaking. The main job of the standards department is that of guiding and aiding experts in the shop and office who develop the standards to be used by them in their work.

The principle of administration not creation dominates the complete field of industrial standardization. It holds true for standards promulgated by and for individual concerns; those issued by trade associations and engineering societies; the ones promulgated nationally by the American Standards Association Inc.; government and military standards; and those global in scope. The standards organization must seek its inspiration not from the posturing actor but from the behind-the-scenes director.

No. 1 Aim—Active Standard—A recent survey revealed that less than one-third of the 95 concerns checked had formal standards organizations. The major common denominator among them was the close kinship between standardization and engineering. This is true of Link Belt Co., whose engineering practice standards are developed by a group composed of the chief engineers of the firm's many plants. Harold F. Watson who heads this body notes that "representatives of other groups such as accounting, production, methods, purchasing and sales are added when their advice is needed or when their interests are involved."

More for Less

Postholes or potholders, standardization is the order of the day, and let it better be done by industry's own standards engineers rather than by government decree. Turn the page for a more detailed explanation of Tom Ross' amusing approach to the subject.

By BENJAMIN MELNITSKY

He adds the significant point that "our ultimate goal is a complete group of active standards which are a product of the best thought and experience of all groups, and for the use and continued growth of which all groups feel a proprietary responsibility."

At RCA Victor standardization is an engineering department activity guided by a policy committee composed of the manager of the standardization section, the firm's assistant director of engineering, manager of the general purchasing division, and chief engineer and plant manager of each of the four RCA Victor plants.

Standardization at the Detroit Edison Co. is the job of a policy committee on which are represented not only engineering but also purchasing and storekeeping. Standards-development work is farmed out to 21 standing committees, each charged with one phase of company operations.

How It's Done—Although standards departments differ widely, certain basic steps are followed in their development and certain typical factors applied:

1. Backing of Top Management—A successful standards engineer speaks from experience when he notes that "the initiation and use of standards is neither a natural nor an easy process. Change is resented and sometimes attended by confusion. Progress is often slow to be recognized by individuals or small groups in the lower echelons of an enterprise. Oft-times the efficient use of new procedures and standards is handicapped by a natural tendency to graft the new onto the old less efficient or desirable methods rather than make a clean cut substitution."

To counteract the very real bugaboos of status quo and complacency, the new standards program should have the initial blessing and continuing support of top management.

2. Formulating Policy — Standardization takes in everything, including, literally, the kitchen sink in the plant cafeteria. The scope of the standards program should be defined at the outset, lest the department head out in all directions. Such ubiquity is rarely desirable. General practice is to relegate responsibility for standardizing of accounting procedures, personnel practices, worker-performance criteria, distribution methods, and the like to the departments most closely affected.

The standards department is generally limited to: (a) Purchasing specifications for materials and parts, (b) material standards for use in engineering, drafting and manufacturing departments, (c) design standards, (d) uniform systems for identifying materials, parts, drawings, and records, (e) standard terminology and (f) co-ordinating company standards with national standards and representing the company on committees of national standardizing bodies.

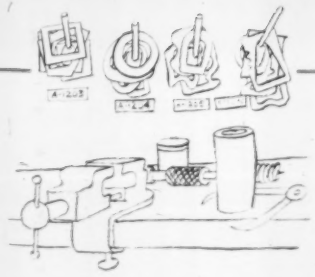
3. Organizing the Standards Department—Unlike the perfect game of solitaire, the efficient standards department has many kibitzers. The more the merrier. Our nation's democratic system offers an excellent model for the novice in standardization. Full participation through fair representation is indeed the crux of good standardization and good government. Dictatorial methods are the anathema of both. As Senator Ralph E. Flanders has written, "Nazi Germany practiced standards by decree and paid the price for it, notably when it standardized its military airplanes too much and too soon."

The standards department which muses in its own ivory tower is hardly doing its job. As has been pointed out, its primary job is that of administering the efforts of experts in the fields to be standardized. For this reason, the department can be small. If eight full-time workers can manage the Du Pont standards organization, a part-time engineer may be more than adequate for a small concern. However, actual standards development should be assigned to as many plant employees as is possible. At Standard Oil Co. of California the chairman of the efficient subcommittee on packaging is the firm's advertising manager. Its members include men from such departments as purchase and stores, manufacturing, marketing operations, and distribution.

The goal of the standards organization in this giant concern is to involve a maximum number of plant personnel. This insures that all viewpoints are represented and that all objections are anticipated in committee and provided for in the finished standard. Even more important is the significant fact that persons who have a voice in the development of standards are more likely to comply with their provisions.

Using the democratic system as a model, the standards department has an executive in the person of the standards engineer, a legislature made up of standardizing committees, and a judiciary in the form of a policy group.

4. The Standards Engineer—A blueprint for the ideal standards engineer might specify first that he be informed of company operations, both technical and administrative. He must be a good businessman who guides his work with a critical eye to cost factors. He must be a diplomat who can assuage dented egos and battered sensibilities at the conference table. He must be able to keep together a group of men whose temperaments, interests and personalities may vary widely. The man in charge of the standardization program should be thoroughly familiar with avail-



WHIMSICAL and highly amusing is *The Strange Case of the Seven-Sided Post Hole*, a booklet executed by Tom Ross and published by the American Standards Association. The cartoons reproduced herewith and on the cover are representative of the dozens appearing in the booklet which traces the trials and tribulations of one Digby Holeston Postlethwaite in his efforts to work out standardization of post holes. His first step naturally was to organize the Association of Post Hole and Hole Post Equipment Manufacturers and Fabricators Inc. which proceeded to draw up rules for recommended practices in making, installing and operating post holes. These were next presented to the American Standards Association and, after first becoming a tentative standard, were rewritten a number of times before becoming "the 1256th American Standard".

Back of the story's hilarious text and pictures is the serious effort to show why and how standards are developed, who benefits from them and why they benefit. Also an attempt is made to point up the truth that the citizens of the country, who are its producers, consumers and distributors, are the best regulators of their own interests.

The consternation which ran rife through the post hole industry when, after incorporating provisions for a six-sided holes in its standards, the government sent through a rush demand for 3 million *seven-sided* post holes can be readily understood by manufacturers doing business with the government. It took a lot of argument finally to convince government engineers that they should conform to the "American Standard for Lap Welded, Butt Welded and Seamless Post Holes" and be satisfied with the six-sided models.

able national standards and, preferably, have had experience on committees of the American Standards Association Inc., the American Society for Testing Materials, or some trade association. He should first acquaint himself with the history and background of standardization and (through plant visitations familiarize himself) with the practices and policies of other companies.

It goes without saying that the title, "standards engineer," is an arbitrary one. There are few university courses in this subject and no BS degrees are currently being offered in the field. An individual may be purchasing agent, storeskeeper, plant manager, or accountant and still fill the job of standards engineer admirably, provided his interests and background suit him for the work.

5. Initiating Department Operations — The new standards department is like a driver with a brand new motor car. The breaking in period can either make or break the car and the department. An excellent beginning point is in the area of simplification. An analysis of company purchases over a period of years will almost certainly bring to light instances such as were discovered many years ago at the Aluminum Co. of America. An investigation there revealed that 75 brands of tool steel were being procured for dies, back-up plates and die blocks.

An analysis showed that only 12 positive types of tool steel were involved. A check into production results indicated that two types were more than adequate for the dies, a third for back-up plates, and a final one for the die block. As the firm's tool engineer, P. J. McCarthy explains, "A long-term study has led gradually to the elimination of three of the original four types used for extrusion tools, so that now a single type of tool steel is used for all extrusion dies and support tools."

6. Evaluating Proposed Projects—The development of standards is an expensive business. A series of committee meetings involving well-paid company members costs a good deal of money. Although the standard they produce will undoubtedly result in economies, the question remains: Are savings commensurate with costs? Far too often there is no adequate answer. Yet, the answer is available. William Floyd, vice president in charge of merchandise at Sears Roebuck, notes "It is well within established techniques of standard cost accounting to evaluate these (cost) factors. If a standardization program reduces stockkeeping units by given percentages in different categories, a dollar-and-cents difference in standard cost between stocking the larger number of items and the smaller number of them, can be calculated." The common practice of evaluating employee suggestions by the standard cost method can, in his opinion, be used in judging the economies resulting from recommendations of the standards department. (*Please turn to Page* 112)

By GUY HUBBARD
Machine Tool Editor

Seen and Heard in **The Machinery Field**

INNOCUOUS HEAT TREATING: One of the greatest machine shop developments which has come within my time, is that of heat generation and heat control which now make possible the inclusion of heat treating and hardening operations in production lines—without the slightest annoyance to nearby machine tool operators. This was driven home to me once again a few days ago during a tour of the huge Cadillac Tank Plant now running full blast near the Cleveland airport, producing Walker Bulldog tanks.

Among numerous unusual parts involved in this high speed fortress on tractor treads, are bearing rings for the turrets. These steel rings are several feet in diameter. They have hardened bearing surfaces which in the old days would have demanded some such fiery and smoky operation as some of us will recall seeing in connection with tire setting in wheelwright and railroad shops.

In the Tank Plant all this primitive business has been done away with by special machines which rotate the big steel rings through electronic heating and water quenching elements. There is a little clean steam, but no smoke, fumes, "wild" heat or scale. These clean, cool, quiet treating machines are next door neighbors to gear shapers which cut internal teeth in rings and precision grinders which finish grind the hardened rings. There are no complaints. The same would be true if these were flame hardening machines—as they well could be.

This brings up a highly important subject for production men to follow through on at the forthcoming Metal Show in Detroit. If you are interested in equipment which will enable you to locate heat treating operations where they ought to take place—instead of having to "dog-leg" this work to some dim and distant corner of the plant—you will find it somewhere at the Metal Show. What you find may be a big surprise to you, both as to the techniques and as to its convenience, economy and product improvement.

MACHINING STAINLESS STEELS: There has just come to us from Mason Britton, president, Metal Cutting Institute, 405 Lexington Ave., New York 17, a review copy of a 28-page brochure which goes right to the heart of things involved in milling, drilling, reaming and threading of commercial grades of wrought stainless steels.

These metals are more and more commonly encountered—especially in connection with defense contracts—and they are apt to constitute pitfalls for the unwary when it comes to bidding on and tooling up for such contracts. While rigid machine tools are a must for this work, rigidity is useless if selection, grinding and speeds and feeds of tools are wrong, or if coolants are wrongly chosen.

This book represents long and painstaking work on the part of the research and technical committee of the institute, made up of 10 experts representing that number of leading toolmaking and machine tool building companies. It sums up the know-how of these men in a ways that you can readily apply to your own tooling. For $1.00 you can get a copy of this book and thereby avoid a lot of tooling trouble.

MACHINES WITHOUT BASEMENTS: Modern tendency to build thoroughly liveable homes without basements has its counterpart in modern machine tools which require no pits below floor level. In the case of houses, this largely is a matter of economy but in the case of machine tools it is a matter of economy plus mobility.

Only within recent years has mobility of machine tools become a factor to be reckoned with. In days gone by, a heavy machine tool was a "fixed asset" not only on the books but also on the plant layout. Model changes of manufactured products were infrequent. When they did take place, routing of work was planned to suit immovable machines instead of machines being relocated to suit the new work.

With the development of mass production of automobiles, many machine shop traditions were smashed —among them being that of immobility of machine tools. It became common practice to relocate most of the equipment to gain efficiency with each model change. This practice has spread rapidly to other big production operations where economy of work flow is important.

While some big machines—including those involving impact and those which must operate at floor level—still require basements, designers have accomplished surprising things in keeping most machines above floor level and in doing away with special underpinning for many of the fairly heavy ones.

In this connection, I have just been studying with keen interest the bed and frame design of Bullard vertical turret lathes which makes it possible for these heavy duty machines with tables up to 74 inches in diameter to be kept 100 per cent above the floor line.

This involves extremely clever civil engineering in the way of bracing beds and frames and making them supplement each other. It involves generous use of metal and strategic placing of this metal. It involves placing of tools so that they will have minimum effect in the way of prying machine elements apart. To sum the whole thing up, it involves thinking of cast iron as "stiff jelly" rather than as something inflexible—then designing so as to get maximum stiffness and vibration dampening out of this stiff jelly.

At the same time the machines have been tailored to fit their operators who—except possibly in Texas —average 6 feet or less in their safety shoes.

Jet Plane Production Spurs
UNIQUE MACHINES AND METHODS

Pilot lines at Lockheed break precedents with radically new types of machines designed to "carve" wing sections from solid metal and to produce many other intricate parts by template-guided tools

By NORMAN LYNN
Los Angeles Correspondent, STEEL

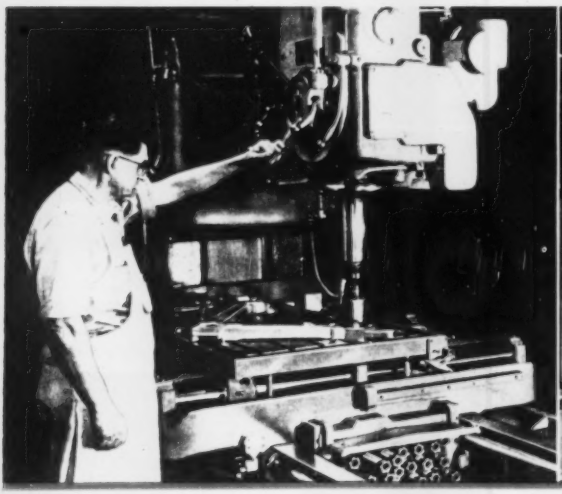
REVOLUTIONARY design and construction of jet-age airplanes with stronger materials, larger components and fewer pieces has brought a new breed of machine tools into use at Lockheed Aircraft Corp., Burbank, Calif. So as not to limit its designers in engineering jet airplanes of highest performance, Lockheed has modernized and re-equipped its factories with new kinds of machine tools. These machines are of higher capacities and higher powered than those of World War II which are now regarded as obsolescent and relegated to secondary status.

New Structurals — High aerodynamic and structural loads of jet airplanes require new types of structural elements that must be machined; these include integral stiffened, tapered and sculptured sheets. To mill either tapered or straight integral-rib skin panels from solid or rough-forged aluminum alloy, Lockheed uses a Giddings & Lewis Hypro aircraft skin mill, type 100. This complex tool, designed in conjunction with General Electric Co., is one of the largest profiling machines in existence. A planer-type miller, it is 18 feet high, 30 feet wide, 80 feet long and weighs 300 tons.

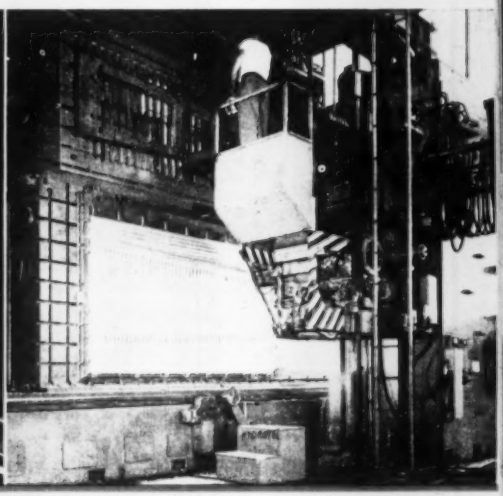
Twelve motors totaling approximately 350 hp drive this two-feed machine designed to work in a feed range of 3 to 4 to 150 inches per minute with infinite intermediate speeds. The power supply is delivered by 18 motor and generator units. A 20-hp motor drives the work table of 100-ton load capacity and motors of 7½ hp each move the cutting heads along guide rails.

Combined electronic and hydraulic control systems give extreme flexibility of control in operation in three dimensions with two feed motions. Both longitudinal and lateral feed motions have sequence speed control. At any selected speed the table and the three cutting heads can be moved by: Individual control by the operator of each of the two feed drives; manual steering control to run the two feed drives simultaneously with co-ordinated speeds; and by the

Cincinnati Bickford drilling machine equipped with Bullard Man-Au-Trol spacing table which permits accurate repetition of predetermined patterns of holes—as many as 260 per setup



Cincinnati Hydro-Tel "skin mill" for milling integrally stiffened members from the solid. Combination of rise-and-fall of 360-degree tracer units translates shapes from full size template to aluminum slab



G-E two-dimension automatic tracer control.

Precise Measuring System—Gang cutters up to 12 inches long and 8 to 10 inches in diameter may be mounted in the milling attachments. Cutting speeds ranging up to 10,000 fpm remove a maximum of 600 cu in. of metal per minute. Each of the three milling heads is powered by a water cooled, 100 hp induction motor. An adjustable frequency system controls speeds. To locate the cutter heads accurately, a complete and precise measuring system is provided across the machine. Table ways are protected by sheet metal strips drawn over the exposed ways as the work table moves. Control interlocking throughout the machine assures safe operation.

Lockheed says its Cincinnati horizontal Hydro-Tel is one of the largest and most versatile tracer-controlled planer mills ever built. With high-power, high-speed spindles (50 hp at 7200 rpm) it reproduces parts perfectly and rapidly by tracing a model of the part. Without re-setup it is capable of reproducing 12 contours in each plane. It is particularly adaptable to development of integrally stiffened skins and will hold thin sheets up to 120 x 432 inches while making cuts of as much as 1½ inches in depth.

Lockheed finds it fine for parabolic profiling. The hold-down clamps are vacuum-operated and the work table is capable of taking a concentrated load of 1000 psf. It has full tracer coverage of 360 degrees in the horizontal plane and 180 degrees in the longitudinal. The individual heads will swivel 30 degrees either side of vertical normal to the length and width of the table. Milling tolerances range from ±0.002-inch in skin thickness and ±0.005-inch for stringer thickness. With this planer mill Lockheed has minimized tooling and setup times for economical machining of large structural elements at low or high rates of production.

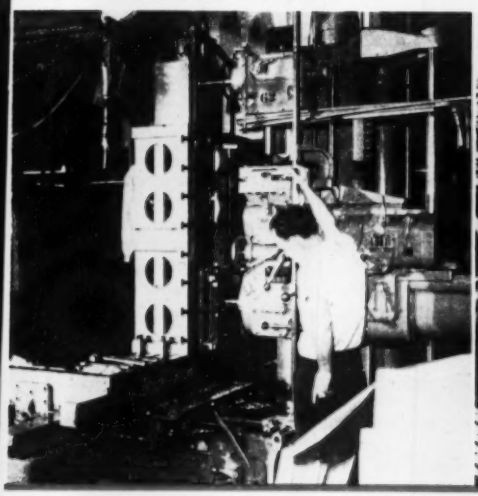
Vertical Milling Machine—Cincinnati vertical Hydro-Tels are used to eliminate intricate, expensive tools and hours of setup time. A vertical milling machine, it has the following movements: Table, right to left; ram, front to back; and spindle carrier, up and down. A hydraulic automatic depth control unit for die sinking and similar operations enables the copying and duplicating of convex and concave contours. It is capable of 360 degrees automatic profiling, from master templates either external or internal to any outline. The 360 degree profiling may be by-passed and the machine used for conventional milling if desired.

Said to be the first in any industry is Lockheed's horizontal boring, drilling and milling machine equipped with Hydro-Tel tracer control. Manufactured by Giddings and Lewis it is found to be very profitable in machining forged landing gear parts and other linkages in one setup. It is particularly well adapted to "short-run" hogged-out parts.

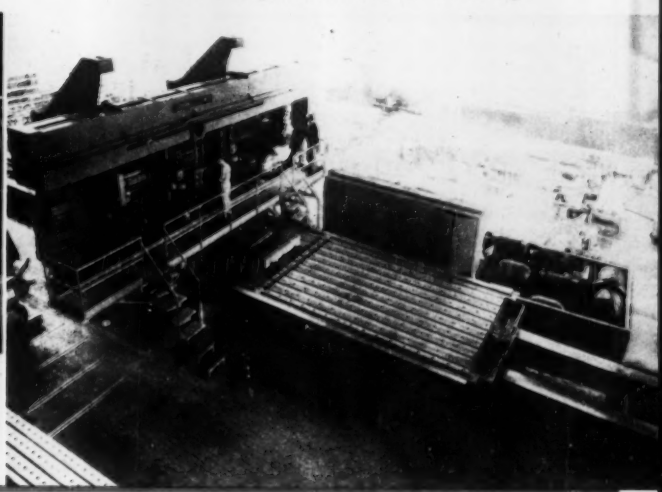
Four power driven movements are manually controlled: Table, front to back; table saddle, right to left; spindle carrier, up and down; spindle, right to left. The 4-inch bar sweeps a 36 x 72 inch table. Cutting is controlled by a simple template guide. A 360-degree profiling unit controls the spindle carrier and the table feed for automatic milling of profiles from master templates either external or internal of any outline in the vertical plane.

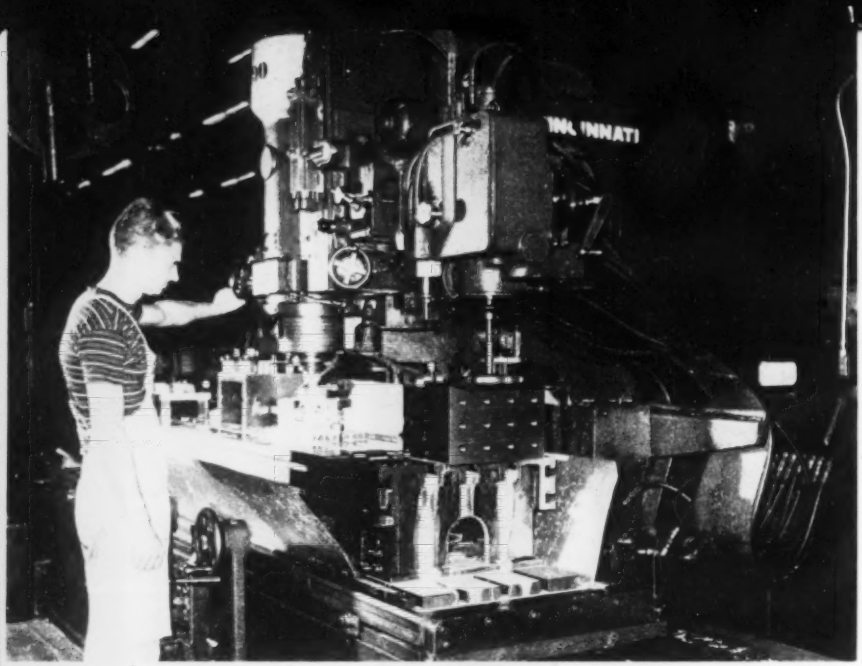
Jigless Drilling—Fast, repetitive drilling is done at Lockheed without expensive drill jigs or fixtures with

Adaptation of Hydro-Tel tracer control system to Giddings & Lewis horizontal boring, drilling and milling machine makes possible the machining of linkage and other parts of irregular shape. Template-guided tracer at top controls motions of milling spindle in front of operator



Giddings & Lewis horizontal milling machine for form-machining integral rib airplane wing sections from solid or rough-forged aluminum alloy slabs. Longitudinal and lateral feeds are controlled electronically to give desired shapes. This machine is 80 feet long, 30 feet wide and 18 feet high



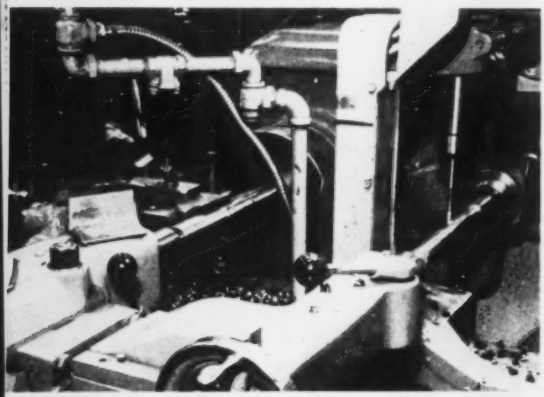


Machining intricate, irregularly - shaped parts is accomplished rapidly and interchangeably by Cincinnati vertical Hydro-Tel machine. Part in front of operator is being milled to exact shape and size of master at operator's right

a Cincinnati Bickford drill and spacer combination machine tool with automatically indexing spacing table. Without the table the drill does much of the work of either conventional radial drills or jig borers. Heavy parts—a specialty—can be automatically positioned under the jig borer spindle. The 32 x 40-inch table traverses 20 inches. Lockheed has found that use of this accurate and speedy machine results in large dollars savings from reduction of parts handling time and elimination of costs of storing and maintaining drill jigs and fixtures.

A new and less costly technique for reproducing circular contoured parts using a tracer-guided, hydraulically-controlled cutting tool is found in Lockheed's use of the Lodge & Shipley Copy-Matic lathe. On actual production runs this tool has reduced machining time to one-eigth that previously required. Savings have run as high as $8000 on a single lot run.

Lodge & Shipley tracer-guided lathe viewed from rear to show master part, right, being traversed by "feeler" which transmits its path to cutting tool, left, thus reproducing the shape of the master in successive workpieces



Develops High Cycle Mills—Part of a long-range program to convert more nonferrous machining to high speed methods, Lockheed has pushed development of Cincinnati and Kearney & Trecker high cycle mills. Only prototypes as yet, the mills will replace Lockheed's older mills. The Cincinnati 4/36 vertical high cycle mill of hydromatic type has a table travel of 36 inches longitudinally, and a ram cross travel of 16 inches. The Kearney & Trecker vertical high cycle milling machine and the horizontal high cycle milling machine are of the knee type with automatic feed cycles. Longitudinal feed range, hand or power, is 34 inches for both machines.

Installation of the new machines required new types of processing equipment. Lockheed estimates that only one-third of the total cost of installing a machine tool is the machine itself; another one-third goes to the building to house the equipment and another one-third goes for processing equipment.

Lockheed uses a 36-foot quick quench furnace capable of quenching 3000 pounds of aluminum parts in 5 seconds within a temperature tolerance of 3°. Scheduled for installation is a complete atmosphere-controlled steel heat treat setup consisting of a Lindberg atmosphere heat treating furnace on rails which will pass over in sequence a Whirlflow quench tank, an austemper-martemper quench tank, a water quench tank, a degrease solution and a spray tank and a Cyclone tempering furnace. The furnaces will be 4 feet in diameter by 15 feet deep.

Press Clips Produce Wrinkle-Free Stampings

By R. B. STANTON

New type clips are mounted on sheet metal blanks to prevent wrinkles prior to press operations

WRINKLED flanges, beads, etc., are quite common on ferrous and nonferrous stampings made by pressing sheet materials between a rubber pressure pad and low-cost form blocks or dies. In many circumstances, more time is required to pound out the wrinkles manually than to complete the initial press operations. North American Aviation engineers at Los Angeles have developed new type clips which make it possible to produce stampings without wrinkle defects.

Rivet Assembled—Each clip comprises three flat 75S-T6 aluminum alloy parts, which are fabricated by bandsaw cutting in accordance with the contours of specified stampings and the dimensions of flanges or beads which must be formed thereon. The parts are rivet-assembled so that two outer components will project a predetermined distance beyond one edge of the centerpiece, which is one gage thicker than the material to be stamped.

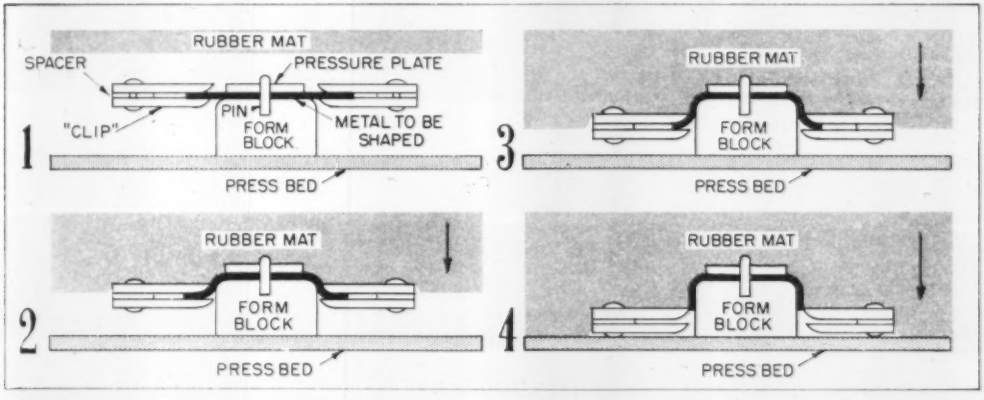
Assembled clips are mounted on the edges of sheet metal blanks prior to forming operations. They may or may not encircle the dies—depending on the extent of the area or areas in which wrinkles would most likely be produced on certain stampings, if no clips were utilized.

Controls Metal Flow—Purpose of each clip is to restrict the flow of metal in its area so that the material will be stretched in a desirable manner instead of being wrinkled by shrinkage; the clip may be used in producing either a stretch or shrink flange. Both open and closed angles have been formed in one press operation where a guide block was used to force a clip to follow the contours of a form die. Severe stretch flanges have been formed without cracks by using clips to restrict stretching along sensitive edges to the point of disengagement.

There is no reason to believe that clips of the type in question can or will prevent all stamping wrinkles or defects which may necessitate rework. However, time studies recently completed by North American indicate that 8 of every 10 hours heretofore required to finish the products of an hour's presswork can be saved where clips are utilized with effectiveness.

Better Physicals—Clip-formed stampings have better physical properties, smoother contours, and more dimensional accuracy than the parts which would be reworked due to wrinkles and related defects.

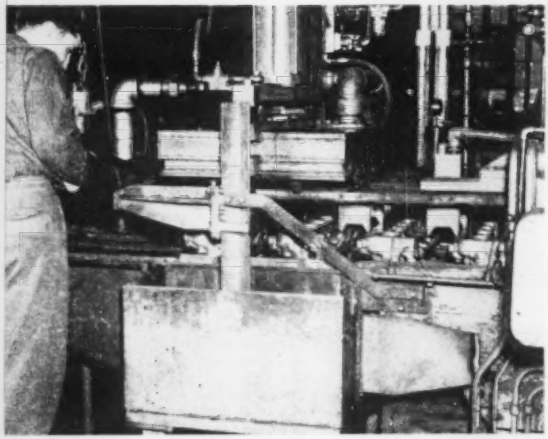
These diagrams indicate the basic function of clips used in the production of wrinkle-free stampings



Thorough Washing Insures Clean Cylinder Heads

Compact and efficient setups on Studebaker production lines prevent subsequent troubles from dirt and chips

By F. D. FOREMAN
Superintendent, Motor Division
and
E. B. ROGERS
Foreman, Cylinder Machining and Assembly
Studebaker Corp.
South Bend, Ind.



Washing setup at end of line on which cylinder heads are machined. Each head is indexed on a track to a position under an air-operated plunger with a sealing gasket while water is fed down through jacket openings

A COMPACT, automatic washing machine in the cylinder head production line at Studebaker Corp.'s South Bend, Ind., engine plant insures a clean product at final assembly and avoids improper fits or service failures likely to result from dirty surfaces. The washer is fed directly from the Foote-Burt line that performs practically all the machining operations on cylinder head castings.

Although head castings are cleaned in the foundry, they may contain some core sand not loosened there; and in the process of machining, may catch many of the chips from the cuts made. Since all such foreign matter should be removed before assembly starts, Studebaker places a washer directly on the line where it receives castings immediately after all major machining is done.

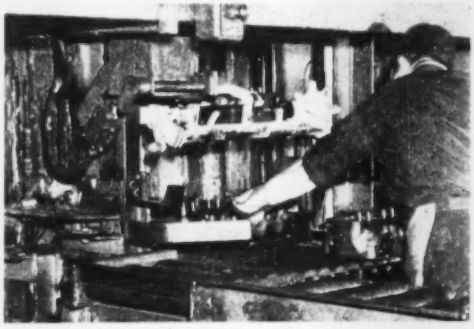
Stay on Conveyor—Such a location permits castings to remain on the conveyor that carries them from the machining line directly onto the assembly roller conveyor and requires only a few feet of space, most of it given over to a sump tank into which the wash water carrying the foreign matter is discharged. This water is filtered and then is returned by a pump to wash heads as rapidly as they are indexed into place.

As cylinder heads are indexed from the Foote-Burt machine, they pass along a track directly under an air-operated washer head that is lowered to clamp against gaskets on top of the cylinder head casting. Immediately thereafter, water from the pump is fed down, washes the top of the head and flows through water passage and out of end port holes. Flow is rapid and discharge drops into the tank below the head. Much of this tank is under the conveyor track.

Just before the next head is advanced to washing position, the one just washed is released and is pushed onto a roller conveyor along which valve guide bushings are pressed into place by a special machine.

Valve Seats Machined—After this latter operation, valve seats are machined and every head is then gaged and inspected before the heads arrive at a Centri-Spray washer. This is a much larger machine than that described above and includes fixtures that are advanced rotating slowly through the machine.

During this translation, the heads are sprayed from all angles by a hot washing solution much of which also enters cored passages and then drains from them as the head turns over and over. The result is to clean all surfaces and, finally, to discharge the castings onto a roller conveyor.

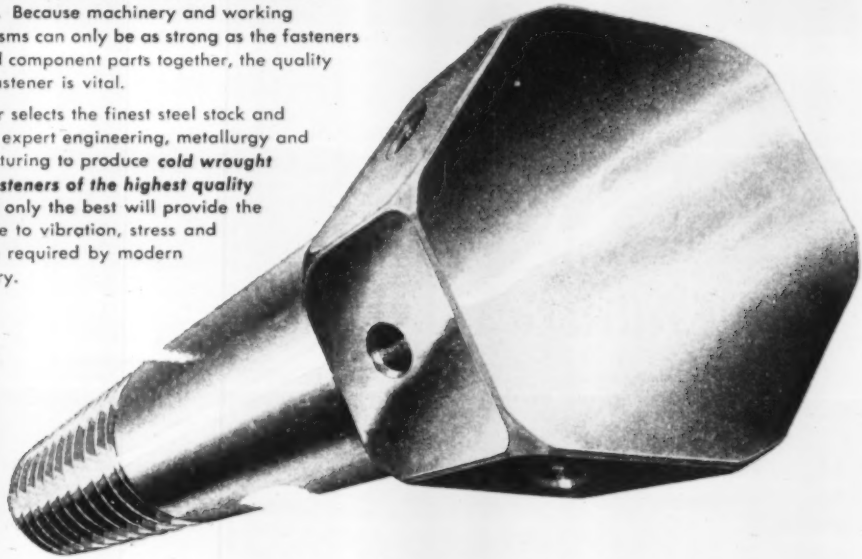


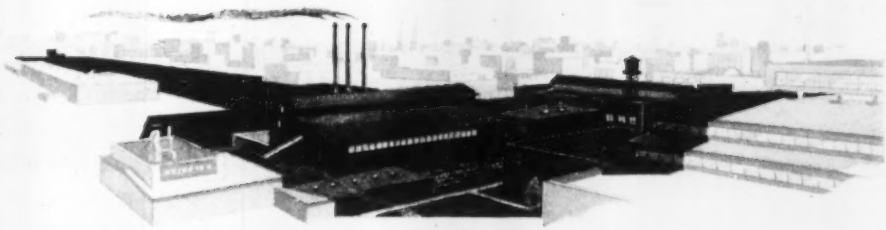
Unloading end of final washing machine where cylinder head assemblies are taken from conveyor fixtures and put on roller conveyors for transfer to final assembly

IF *Quality* COULD CAST A SHADOW . . .

. . . Our shadow would reach clear out across industry. Because machinery and working mechanisms can only be as strong as the fasteners that hold component parts together, the quality of the fastener is vital.

Chandler selects the finest steel stock and employs expert engineering, metallurgy and manufacturing to produce ***cold wrought metal fasteners of the highest quality*** . . . And only the best will provide the resistance to vibration, stress and abrasion required by modern machinery.





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** Cold Wrought Metal Fasteners by*

Chandler Products Corp.

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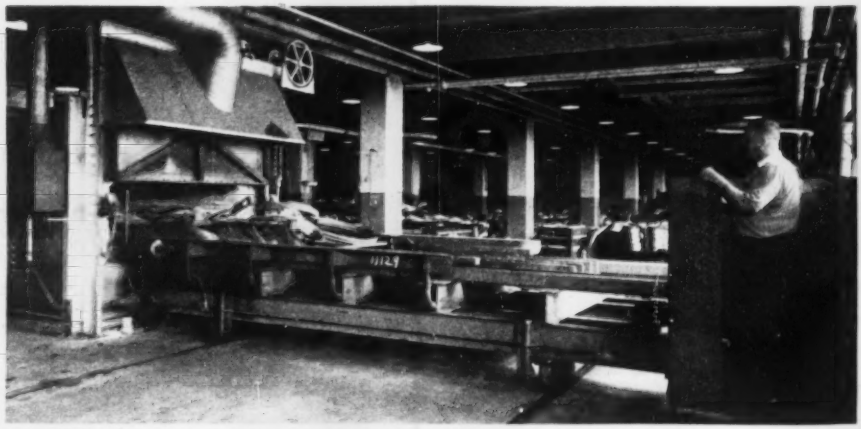


Charging the annealing furnace. One operator services the entire installation using the transfer car for loading and unloading. The same man also operates the furnace. Coils of wire are held together by copper slings

Furnace Loading Methods Facilitate Brass Wire Annealing

Specially designed materials handling features permit loading and unloading of pans by fork lift trucks used to transport wire coils. Overhead handling equipment is virtually eliminated in low-ceiling plant

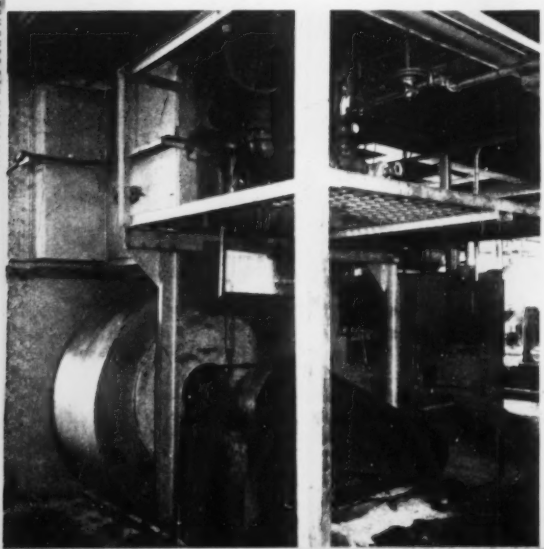
By W. J. KRAILING
Furnace Engineer, Bridgeport Brass Co.
Bridgeport, Conn.

WHEN a brass mill has only limited room for handling materials in the vertical plane, it is confronted with a critical operating problem. Most heavy materials handling equipment is designed for transfers, using overhead cranes and similar facilities.

In taking over the wartime Navy shell plant at Bridgeport, Conn., Bridgeport Brass Co. found itself with a fine building, but the ground floor had a working overhead space of only 12 feet. This floor was to be used for extensive nonferrous wire and rod drawing operations, embracing all types of copper base alloys in a wide range of compositions and sizes.

Low Bridge—With the limited head room in this department, fork lift trucks instead of the usual overhead cranes lift and transport loads to the various operations. Copper slings used to transport unit loads usually remain with the load being processed, facilitating quicker and more efficient handling.

The same loading and handling problem was encountered when the company began setting up heat treating equipment for the finish annealing of brass wire. A "pan-pull" furnace is employed. This furnace, designed and built by Surface Combustion Corp., permits loading and unloading of pans by fork lift trucks used to transport the wire coils. It also elim-



Close-up of rear of annealing furnace, showing the high capacity blower unit (lower left) and air heater (upper right)

Pins down press room lubrication problem

THE lubrication of die set leader pins was a headache for New Monarch Machine and Stamping Company, Des Moines, until operators changed to CALUMET Viscous Lubricant No. 8X on the recommendation of a Standard Oil lubrication specialist. Replacing a cup grease, CALUMET Viscous Lubricant No. 8X has eliminated scoring and galling of leader pins caused by faulty lubrication. It is applied just once a day, shows up well on the pins.

CALUMET Viscous Lubricants are true greases fortified with additives. They have a high resistance to the washing action of water and to thinning and throw-off at high temperatures. Their adhesive quality makes them particularly effective in the lubrication of open gears and such special applications as the protection of leader pins.

CALUMET
Viscous Lubricants

To apply the advantages of CALUMET Viscous Lubricants to your own operations anywhere in the Midwest, call for the services of the Standard Oil lubrication specialist in your area. Contact your local Standard Oil Company office or write: Standard Oil Company (Indiana) 910 South Michigan Avenue, Chicago 80, Illinois.

What's your problem?

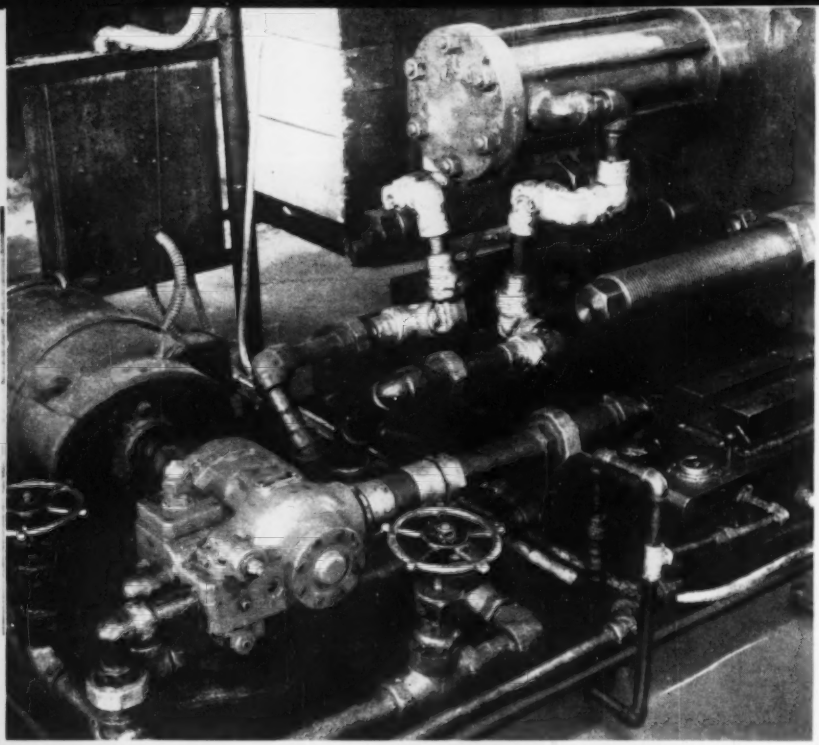
C. P. Rohde of Standard's Des Moines office is the lubrication specialist who applied the unique properties of CALUMET Viscous Lubricants to the solution of this problem. Like all Standard Oil lubrication specialists, he has a broad background of practical experience plus thorough training in Standard's own schools.

His on-the-spot service is typical of that available to industry everywhere in the Midwest. Making their headquarters at Standard offices throughout the area, these lubrication specialists are on call at all times to help you find the answers to problems involving lubricants and fuels. Arrange today to take advantage of this service by calling your local Standard Oil Company office. When the specialist calls, be sure to get information on these outstanding products:

STANICOOL HD Soluble Oils - Because they contain additional compounding, these heavy-duty soluble oils possess not only the cooling ability of an emulsion but also the ability to give better tool life and finer finishes than can be obtained with a conventional soluble oil.

STANOSTAMP Compounds - Here are three established products for stamping or heavy drawing operations of either low-carbon or alloy steels. Water can be added to these paste compounds to provide the most economical applications. STANOSTAMPS offer maximum protection for dies and work. These compounds can be removed readily in conventional washing equipment.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*



What's your problem?

D. R. Clay, lubrication specialist at Standard Oil's Grand Rapids office, helped this manufacturer put hydraulic system lubrication on a trouble-free basis with STANOIL Industrial Oil.

One of a corps of such specialists, he makes his headquarters close to the plants he serves. He offers on-the-spot lubrication service that is backed by extensive experience and training in the application of modern lubricants and fuels. The same service is available to you wherever you are located in the Midwest through the lubrication specialist in your own locality.

Arrange today for a visit by this specialist. Just phone or write the Standard Oil Company office nearest you. When he calls, ask for actual performance data on these outstanding products:

SUPERLA Greases — Available in a wide range of consistency grades and in both lime-soap and soda-soap types, SUPERLA Greases cover a wide range of operations.

STANORUST Rust Preventives The eight grades of STANORUST form one of the most complete and effective lines of rust preventives on the market today. Each has been scientifically and specially developed for its intended use. The grades range from a fingerprint remover to a heavy semi-solid that protects against corrosion for years under the most severe outdoor exposure.

5 years, no change of oil

THIS midwestern die casting company called in a Standard Oil lubrication specialist when operations were started over five years ago. One of his recommendations specified the use of STANOIL Industrial Oil No. 18 in the hydraulic unit of the die casting machine shown. Now, after five years of service, this original oil is still in nearly perfect condition. There is no deposit and no varnish in the hydraulic system. There has been no need to clean the system.

This performance is typical of the results gained by STANOIL users who count on its greater oxidation stability and corrosion resistance to deliver trouble-free lubrication in speed reducers, head stock gears, auxiliary turbines, and compressors, as well as hydraulic systems.

STANOIL
TRADE MARK
Industrial Oil

The Standard Oil lubrication specialist in your own area can help put the advantages of versatile STANOIL Industrial Oil to work in your plant now. A call to your local Standard Oil (Indiana) office is all that's necessary. Why not do it today?

Standard Oil Company, 910 South Michigan Ave., Chicago 80, Ill.

STANDARD OIL COMPANY **STANDARD** *(Indiana)*

inates the need for overhead handling of material which was well nigh impossible under the conditions existing in the converted plant.

Roller Rail Equipped — This furnace uses a perforated chrome-iron pan about $\frac{1}{4}$-inch thick, $5\frac{1}{2}$ feet wide and 12 feet long, for carrying the charge of wire to be annealed. The furnace is equipped with roller rails to facilitate the moving of the pan into and out of the furnace. The perforations are about $\frac{3}{8}$-inch in diameter and located on staggered 1-inch centers. The wire is loaded onto the pan as the pan rests on a loading table. A transfer car, which moves on rails, is then moved up opposite the loading table.

The pan is drawn onto the transfer car by means of a multiple hook device mounted on a roller chain, built into the transfer car. The transfer car then rolls for a few feet until it is opposite the annealing furnace door. The door is raised and the loaded pan of wire transferred by a pusher head on the transfer car roller chains, from the transfer car into the furnace. Loads of approximately 8000 pounds of wire are processed in about $2\frac{1}{4}$ to 3 hours, depending upon the time and temperature required. Rods are also annealed in this same furnace.

Process Reversed—After the charge has been held for the specified time at the annealing temperature, the handling process is reversed and the pan drawn from the annealing furnace onto the transfer car. The car then proceeds until it is opposite the air cooling chamber. This chamber, designed to provide rapid cooling of the wire down to convenient handling temperatures, is equipped with an air-operated door. The pan is moved by the transfer car mechanism onto the rails of the air cooling chamber, and the fan in the roof of the cooling chamber is started.

Air is drawn from the partly opened door of the cooling chamber up through the perforated pan and through the wire—and vented through a 4-foot square hole in the roof of the cooling chamber. The heated air is carried off at this point by a duct which also serves to vent the annealing furnace. This particular air cooling chamber was developed by Bridgeport Brass Co.'s engineering department to provide for maximum speed of cooling of the wire charges.

Cooling in this chamber is further accelerated by water-cooled copper coils around the side walls and roof of the chamber. The cooling of the high zinc brasses must be carefully controlled to prevent precipitation of the beta phase which makes the rods and wire hard and thus difficult to machine. A water spray is also available in this cooling chamber, but is only infrequently used, because of the pan warpage which it causes.

Finish Based on Grain Size—Most of the wire annealing work carried out in the pan-pull furnace is carried out at temperatures in the range of 420 to 570° C, although the furnace is used for temperatures as low as 275° C for stress relieving and up to a maximum of 675° C for annealing. Finish annealing specifications for brass wire are based primarily on grain size, Rockwell hardness and tensile strength. This furnace provides extremely close control of the wire by all these standards.

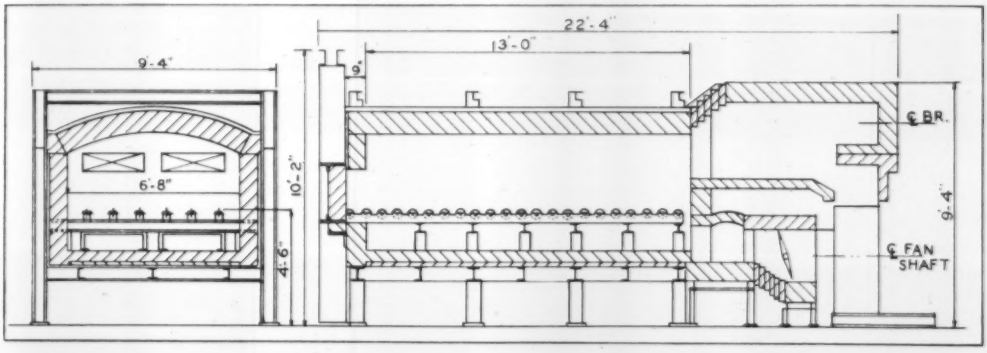
The uniform properties of the wire are due to the uniform temperature attained in the coils due to the high rate of circulation of the heated products of combustion in the convection furnace. True metal temperatures are obtainable in a convection-type furnace, and for this reason unequal size coils will respond comparably to equal crystal size specifications, provided the time cycle is sufficiently long for complete saturation of the heaviest coil. The lightest coil meanwhile will not have exceeded the desired temperature and thereby not have become softer, notwithstanding the somewhat longer time of exposure at temperature.

All products of combustion, after leaving the fan, pass through the charge before returning to the fan. This positive circulation of the heated gases is implemented by the perforations in the loading pan which make possible the passing of the gases through the load rather than over it.

Frequent grain size measurements are made on each coil processed in the furnace. Samples are cut from each batch of wire and sections polished and examined under the microscope.

Oven-Type Unit—The furnace is essentially an oven-type unit with a gas-fired air heater used to provide the heat source for annealing. A maximum temperature of 675° C is available. The air heater is a special refractory-lined unit located at the upper rear of the furnace. It is equipped with a low pressure auto-

Schematic drawing showing furnace construction



matic proportion velocity burner and constant burning pilot. The air heater burns 530 Btu carburetted water gas and has a maximum fuel consumption of approximately 3000 cubic feet per hour. Also located at the rear of the furnace is a recirculating fan which recirculates the heated gases to and from the furnace

The furnace heating chamber has an internal width of 6 feet 8 inches and an internal length of 13 feet. The door opens to a height of 24 inches. To meet the height limitations of the building, the furnace was constructed with an overall height of approximately 10 feet 6 inches, the overall width being 9 feet 4 inches, and overall length 22 feet 4 inches.

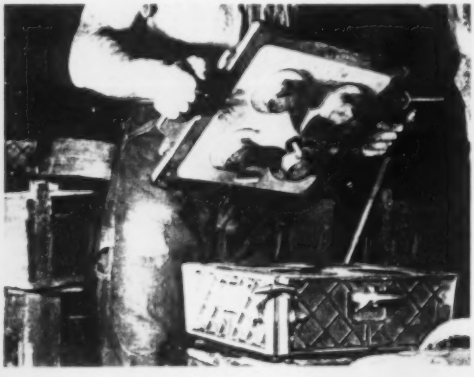
Hearth of the furnace consists of 9 roller rails located on 9-inch centers and running the full length of the furnace chamber. The rollers and rails are made of cast 35-15 chrome nickel steel.

Plastic-Surfaced Plywood Cuts Matchboard Cost 84%

A PLYWOOD and plastic sandwich known as GPX is cutting foundry costs. Produced by Georgia-Pacific Plywood Co., the plastic-surfaced plywood recently made its debut in the foundry field at the Hillside, N. J., plant of Cooper Alloy Foundry Co.

Formerly Cooper Alloy mounted the majority of its patterns on boards made from pattern lumber—the usual foundry practice. Cost of making a conventional 2-foot matchboard was $15. By using GPX instead of pattern lumber, they discovered the same matchboard could be produced for only $2.40—

Foundries have been putting up with lumber mounting boards, despite their shortcomings, because experience indicates that mounted patterns are much more suitable for production work. Lumber has a tendency to warp and shrink and patternmakers must paint and shellac the boards to minimize these tendencies—a costly process.



Matchboard of GPX material is shown being removed from a sand-filled flask after the circular patterns mounted on the board have made their impressions in the sand

In addition, the excessive thickness of the boards—$1\frac{1}{4}$ to 2 inches—results in mismatch and shifts in the mold. A rejected casting is wasted production; enough of them can make a serious dent in profits. Not even regular plywood makes a completely satisfactory mounting board, according to foundrymen. Plywood requires three coats of shellac or paint.

Putting GPX to the test, this is what Cooper Alloy discovered: It required no finishing and stayed dimensionally stable under the terrific abuse of the molding process. It didn't warp or crack. Hot or damp sand didn't cling to it, nor did it absorb moisture. Castings were cleaner and its long service life contributed materially toward lower costs.

Aside from use in production processes Georgia-Pacific engineers believe is could easily prove valuable in other parts of the foundry. High density material with a special antislip surface could be used for catwalks and platforms around industrial equipment.

Its tremendous abrasion resistance (30 times greater than ordinary plywood), acid and alkaline resistance, moisture impermeability and snag-proof, easy-to-clean surface will undoubtedly suggest many uses.

Ryan Designs Own Drill Jigs

Precision drilling 160 bolt holes in 80 minutes in flanges of General Electric J-47 jet engine exhaust cones is accomplished in a fraction of the time normally required by means of several Ryan designed-and-built drill jigs now in use.

Each drill jig consists of a precision-made steel tool which rigidly holds the work while a pair of Keller Airfeedrills cut through the $\frac{1}{2}$-inch stainless steel flange. After the cone assembly is locked in the jig, the drills are pivoted into position in such a way that their cutting bits are exactly located as required by engineering specifications. The hole pattern for these bolts must be accurate within ten-thousandths of an inch, radially. Hole size tolerance is plus 0.004 and minus 0.001-inch.

A single valve is pressed by the operator to drive the drills which are powered by a pneumatic blast that actuates pistons in the drills. Drills start simultaneously, cut through the tough metal and return to their starting position without supervision. The automatic return is individually controlled by special pre-set air valves which go into action when the drill bits have penetrated to the required depth.

A water-soluble lubricant is sprayed on the cutting area, by a motor-driven pump, to carry away the heat generated by drill friction. The entire drill jig is immersed in a steel tank which collects the lubricant and circulates it through the system.

Spring Design Problems Solved

Problems of spring design are quickly solved with the Calculaide spring computer devised by American Hydromath Corp., New York. This new computer correlates, in one setting, all the variables in spring design, like outside diameter of spring, wire size in diameter and gage number, number of active coils, material and its torsional modulus G, maximum sheer stress, load and total deflection.

New tighter fit

So positive is the fit between seat and plate on this time-tested Brosius-Westling Goggle Valve, that the unit pressure is comparable to that found on flange gaskets in pressure piping. In addition to this new feature, distortion is eliminated due to heavy construction and separation between barrel and frame... moreover, manual operation is easy and fast even after long periods of idleness. Numbers of these valves are currently contracted for, yet capacity has not been reached and your inquiry is invited.

BROSIUS DIVISION

Salem-Brosius, Inc., Pittsburgh 15, Pa.

Affiliates: Salem Engineering Division, Salem, Ohio;
Salem Engineering Co., Ltd., Milford nr. Derby, England; Salem Engineering (Canada) Ltd., Toronto, Canada

Heat Treating Equipment Integrated in Single Unit

A COMPLETE, controlled system of heat treating—the Contro-Therm process has been developed by A. D. Alpine Inc., Culver City, Calif. The integrated process uses a heat treating furnace, a loader, and a quench tank—all in one small unit.

No Manual Handling—Work to be treated is placed on the frame of the loader which will handle several layers of work at one time. The entire load is picked up by the fork bars of the loader, placed in the furnace, loader withdrawn and the work heat treated. After the proper time-temperature interval, the loader is reinserted and the load withdrawn. The loader is turned to the side, guided over to the quench tank by guide rails, and the hydraulic lift is released to lower the load into the quenching medium. The entire operation is performed in a matter of seconds, eliminating all handwork.

A cartridge and special attachment is available for heat treating metal under nitrogen, hydrogen, propane and other additive atmospheres. The cartridge has a tubular connection through the furnace for connection with the foreign supply tank. Heated work remains in the foreign atmosphere until actually immersed in the quenching liquid or, if air cooled, until completely cooled. A retention fork holds the cartridge as the load is dropped into the quench tank.

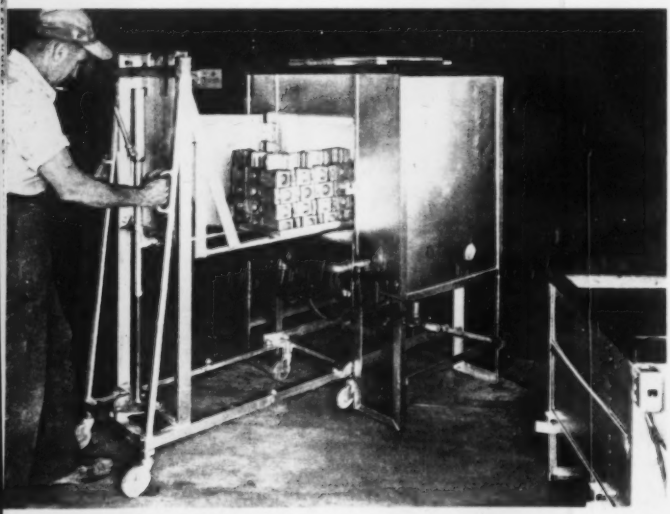
The tubular fork bars that enter the furnace in depositing the load are cooled in the quench tank at the same time the load is lowered, preventing warpage or softening of the forks. Each time the load is lowered and the forks dipped in the quench tank, some of the liquid enters the tubes through a small hole near the back. Expansion is taken care of through pressure relief pipes that release steam if the forks are left in the furnace too long.

The quench tank is the constant level, recirculating, cooling type. As the load is lowered into the tank, the overflow runs over a low dividing wall into the reserve section of the tank. In this section is a pump which constantly circulates the liquid back into the main part of the tank, aerating and cooling the liquid.

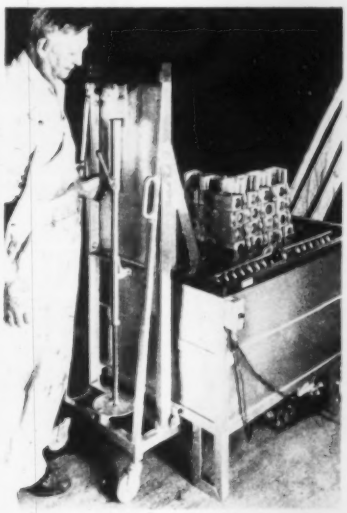
Multiple Uses—Six furnaces, ranging from 2 cu ft to 24 cu ft capacity constitute the line. All these units are built for multiple use with normal furnace atmosphere, as well as with additive or foreign atmospheres used in hardening, drawing, case hardening, nitriding, bright annealing and copper brazing.

According to Alpine engineers, controlled temperature distribution makes all heat-treated pieces of equal quality regardless of the positions they occupy within the furnace. A jig-full of unrelated items of varying density may be treated simultaneously. Through the proper use of the fuel, a positive and protective atmosphere is kept inside the furnace.

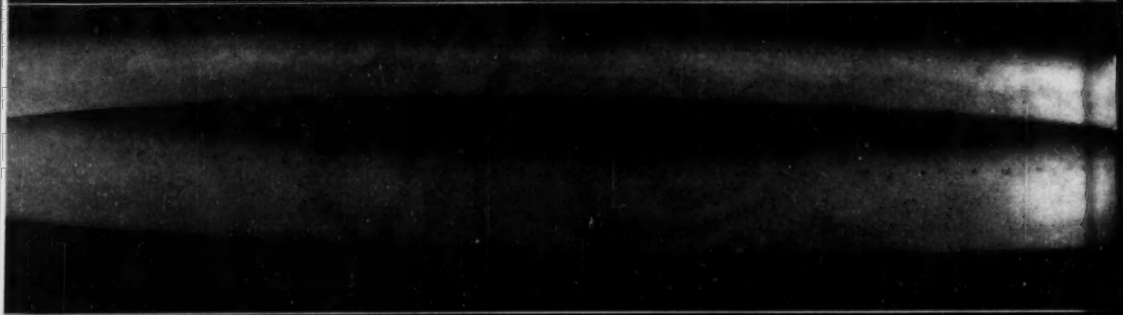
Several layers of work can be handled at one time by the loader. The entire load is placed in the furnace, loader withdrawn and load heat treated



After load is heat treated and withdrawn, loader is turned to side, guided to quench tank and hydraulic lift released to lower load into quench tank



There's safety in welds



OK'd by Radiography

Radiographs showing welds in gas tanks. Lower radiograph shows acceptable tank weld.

These radiographs show the welds in propane gas tanks. The upper discloses a lack of fusion and heavy gas porosities. Out of a lot of several hundred tanks, Radiography showed a dozen to be hazardous—twelve potential accidents that were prevented.

Because Radiography can prove the soundness of welds it is opening new fields to welders in manufacturing pressure vessels and in other applications where welding was once barred, it is now an accepted procedure.

This is why Radiography can help you build your business as well as earn a reputation for highly satisfactory work.

If you would like to know more about what it can do for you in your own work, discuss it fully with your x-ray dealer.

EASTMAN KODAK COMPANY
X-ray Division
Rochester 4, New York

Radiography...

another important function of photography

Kodak
TRADE-MARK

Standardization

(*Continued from Page* 96)

Proposals for new projects should be evaluated in light of cost factors and with full consideration given to availability of standardization personnel, need for the standard and others. If, for example, the proposed standard can be adapted from one already in existence, the cost element may be inconsequential. Thus, in setting up its purchasing department specification 8833B, "heat resisting chromium nickel steel," Westinghouse Electric Corp. notes on the printed specification that "in all respects save the exceptions noted below, the material shall conform to A-167, latest revision, of the ASTM." The exceptions were embodied in a few paragraphs in which packing and marking instructions, inspection methods, nature of the metal finish, and few lesser points were specified.

The cost element becomes far more important in a project such as the one conducted by the subcommittee on packaging of Standard Oil Co. of California. Months were required for this group to survey the entire range of packaging materials and package manufacturing methods to determine the best means for reducing the number of container types and sizes and for standardizing methods of applying printed information on the revamped packaging set up.

Both projects paid off because cost of standards development and expected profits were evaluated ahead of time.

7. Implementation—The standards department cannot go it alone. It must have the full backing of management and plant personnel. The need here is for a continuing selling job. Of value is the approach found in the successful advertisement and the profitable sales letter. First is the job of attracting attention. Executive conferences; direct conversations between standards department personnel and others in the plant; booklets in which the workings of the new plant section are elucidated; notices of standards activities in plant newspaper—these and other techniques should be utilized to create an awareness that company standardization is at last a reality.

Having gained attention, the good advertisement seeks next to hold the reader's interest. Widespread participation on committees is the most efficient means of doing so on the standardization level. Conviction, the next selling step, is obtained by the standards department by offering proof—in the form of dollars and cents statistics—of how departmental activities have paid off in accelerated inventory turnover, fewer shop errors, purchasing economies, higher production, etc.

The standards program is being sold actively only when company members are truly standards conscious. This desirable state is evidenced by their voluntary use of company specifications and standards, by their willingness to participate on committees, by their unsolicited suggestions for new projects.

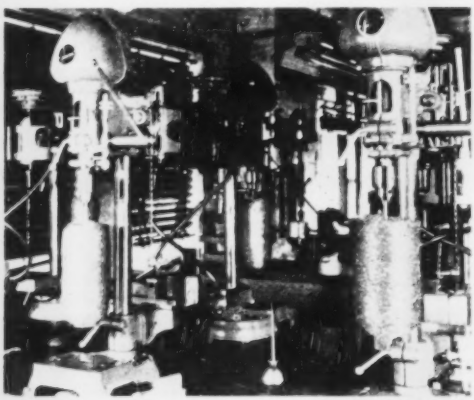
8. Standards Manual—Although not chiefly a selling device, the standards manual does have a beneficial effect in that direction. Its major purpose is to provide a set locale in which company standards may be arranged neatly, convenient for use. Binders which facilitate removal of superseded pages and the insertion of new ones are preferred. Equally as desirable are uniform size and appearance of printed standards as well as numeration of sheets by section and page. Thus, 1-12 indicates page twelve of the first section, 12-1 the initial page of the twelfth section.

Coding is another useful technique. At Westinghouse, for example, any standard number between 1 and 24,499 is a purchasing department specification. Another series of numbers is allotted to process specifications and still others to finish specifications, engineering standards and others. Revisions are indicated by a suffix capital letter; "A" for the first revise, "B" for the second, and so on through the alphabet.

Distribution of Westinghouse standards is anything but arbitrary. For example, finish specifications are distributed semimonthly to a given person in nine company sections. He, in turn, distributes them to specified individuals in his section. This scrupulous attention to distribution should be emulated even in the smallest concern to avoid the difficulties which result when outmoded standards are used or new ones are not available.

9. Revisions—National standards are as a matter of course, examined every few years. If found wanting, they are revised or rewritten. Company standards should be subjected to even more frequent review. Technological changes, varying market conditions, modifications in the supply picture, and any one of a thousand other forces can outdate even a brand-new standard. The need for frequent revision is evidenced by the fact that, between January, 1945, and September, 1950, the standards department at Du Pont made

Power Mounts Improve Cleaning



CLEANING and deburring operations at American Steel Wool Mfg. Co., Long Island City, N.Y., are stepped up by lapping steel wool on mandrels held in chucks of 14-inch bench type drill presses made by Delta Power Tool Division, Rockwell Mfg. Co. Part to be cleaned is held against the revolving steel wool. This method is being used successfully for cleaning castings and plastics parts as well as general polishing operations

A REACTIVE AND IMPORTANT CHEMICAL "BUILDING BLOCK"

with constantly mounting applications in many industrial fields

CHEMICAL AND PHYSICAL PROPERTIES OF OXYGEN

Chemical Symbol	O_2
Atomic Number	8
Periodic Group	VI
Atomic Weight	16.00
Molecular Weight	32.00
Molecular Diameter	3.39×10^{-8} cm
Isotopes	16, 17, 18
Allotropes	Ozone (O_3)
Valence	2 and 6
Concentration in Dry Air	20.93%
Boiling Point (atm. press.)	—183.1°C
Melting Point	—218.8°C
Critical Temperature	—118.8°C
Critical Pressure	49.7 atm.
Critical Density	0.430 gm/cc

Vapor Pressure at Various Temperatures:

Pressure mm. Hg	Temperature °C.
0.76	—219.8
7.60	—211.5
76.0	—200.6
190.0	—194.3
380.0	—189.0
760.0	—183.1

Latent Heat of Vaporization	1635.8 cal./mol. @ B.P.
Latent Heat of Fusion	104.0 cal./mol. @ M.P.
Heat of Reaction with Carbon (Coke)	97,000 cal./mol.
Heat of Reaction with Carbon (Graphite)	94,400 cal./mol.
Heat of Reaction with Hydrogen	68,317 cal./mol.

Boiling Points of O_2 - N_2 Mixtures: 1 atm. Pressure

O_2%	BP °K
90	87.7
95	88.9
98	89.9
99	90.0
99.5	90.1

Entropy:	T °K	Cal / gm mole °K
1 Atm.	50	12.52
	100	40.58
	150	43.31
	200	45.36
	250	46.84
	273.1	47.75
	298.1	48.04

Molal Volume: 0° C, 1 atm. (g) 22,397 cc

Specific Gravity:

@ 0° C (g)	1.429
@ —182.9° C (l)	1.14
@ —252.5° C (s)	1.426

Specific Heat:

BP to 25°C (g)	6.98 cal/gm mol.
—183° to —200°C (l)	12.62 cal/gm mol.
—221.8°C (s)	10.74 cal/gm mol.

Coefficient of Thermal Expansion:

0° C to 100° C (g)	3.674×10^{-3}
—195° C (l)	4.10×10^{-3}

Compressibility Factor: PV = 1.0 @ 1 atm., 0° C

P, atm.	0°C	50°C	100°C	200°C
1	1.0000	1.1838	1.3674	
10	0.9913	1.1796	1.3661	
50	0.9569	1.1642	1.3630	
100	0.9234	1.1520	1.3651	
200	0.9140		1.4000	1.8190
300	0.9625		1.4530	1.8850
400	1.0515		1.5320	1.9610
500	1.1560		1.6220	2.0500

$\frac{C_p}{C_v}$ (atm. pressure)

0°C.	$\frac{C_p}{C_v}$
15	1.401
—76	1.415
—181	1.45

Vanderwaal's Constants: $a = 1.360$ (liter^2, atm. mole^{-2}); $b = 0.03183$ (liters, mole^{-1})

Solubility in Water:

4.89 cc in 100 cc @	0° C
2.6 cc in 100 cc @	30° C
1.7 cc in 100 cc @	100° C

Viscosity:

@ BP (g)	0.00736 CP
@ MP (l)	0.883 CP
@ 0° C (g)	0.0192 CP
@ —193° C (l)	0.245 CP

Moisture Content of Saturated Oxygen .130 gm/ft^3 @ 0°C

Thermal Conductivity:

	cal. / cm-sec-°C
0°C (g)	5.7×10^{-6}
—78.4°C (g)	4.29×10^{-5}
—191.4°C (g)	1.72×10^{-5}

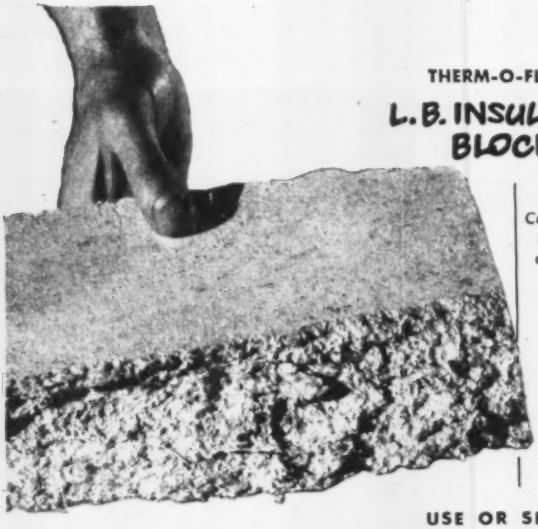
Index of Refraction: —181°C (g) 1.221

Remember that oxygen is one of the least expensive elements available in pure form, and is finding increasing use in more and more fields. As supplier or user, remember that Chemical Plants builds complete production units in all commercial sizes—based on the processes of Gesellschaft fuer Linde's Eismaschinen, A. G.

CHEMICAL PLANTS DIVISION

BLAW-KNOX CONSTRUCTION COMPANY

PITTSBURGH • TULSA • NEW YORK • PHILADELPHIA • CHICAGO • BIRMINGHAM • WASHINGTON, D. C.



THERM-O-FLAKE

L. B. INSULATION BLOCK

Cross-section view, broken to show unique structure.

Insulation block with high insulating efficiency and structural strength. Includes calcined diatomaceous silica, exfoliated vermiculite and asbestos fibre, strongly bonded with a water resistant binder and laminated by an exclusive molding process. In standard or made-to-order shapes for flat or curved surfaces. Weighs about 22 lbs. per cubic foot.

THERM-O-FLAKE

COATING

Insulating cement for exposed furnace brickwork which reduces heat radiation and seals out cold air infiltration. Sticks tightly to basic, silica or fire clay brick. Covers up to 1900 square feet one inch thick per ton.

USE OR SPECIFY

THERM-O-FLAKE

HIGH TEMPERATURE

INSULATION

FOR TEMPERATURES UP TO 1900° F.

THERM-O-FLAKE

GRANULES

Selected quality, exfoliated vermiculite screened for loose fill use, or as aggregate for refractory concrete. Regular granules weigh about 6 lbs. per cubic foot—refractory concrete granules weigh 9 to 11 lbs. per cubic foot.

THERM-O-FLAKE

CONCRETE

Insulation concrete completely prepared and ready for use with addition of water. Has double the insulating efficiency of ordinary insulating concretes. Weight about 40 lbs. per cubic foot. No clay, grog or cement to be added.

THERM-O-FLAKE

BRICK

Molded vermiculite brick for back-up insulation of vertical walls of open hearth and other furnaces. High insulating efficiency and stability. Very light weight, about 16 lbs. per cubic foot.

Write For New Folder!

ILLINOIS CLAY PRODUCTS COMPANY

JOLIET, ILLINOIS

Since 1911

MANUFACTURERS OF

THERM-O-FLAKE *and* GOOSE LAKE *Products*

Goose Lake **FIRE BRICK CLAY**—Excellent resistance to slags, spalling and abrasion.

Goose Lake **GROUND FIRE CLAY**—Good refractoriness and low drying shrinkage.

Goose Lake **FIRE CLAY FLOUR**—Finely pulverized all-purpose fire clay.

Goose Lake **TAP HOLE MIX**—Made from Goose Lake Fire Clay and first quality fire brick—ground and screened together.

no less than 1102 revisions in its thousand or so engineering standards.

10. Outside Standardization — The department charged with standardization at Du Pont feels strongly that benefits may be obtained and material contribution made by participation of company personnel in the national standardizing program. To this end 67 engineers and technical personnel are active on committees of the American Society of Testing Materials, 22 on the American Standards Association committees, three on American Society of Mechanical Engineers Boiler Code Committee, and five on the standardizing groups of the American Institute of Chemical Engineers.

The Gleason Co., a much smaller operator, is represented on the American Standards Association, American Gear Manufacturers Association, and the National Machine Tool Builders' Association. There's no better training in company standardization than in these major league groups. Further, by being represented in the development of national standards, the company has a voice in the nature of these standards.

Maintains Mold Alignment

In the continuous casting of metals it is important that the surface of the metal passing through the mold engage the chill surface without excessive friction. To prevent this, a number of novel features have been introduced.

Experimental work carried out at several steel plants prove that the mold best suited for the continuous casting of steel should consist of aligned sections, and the proper means to maintain this alignment during the casting operation. One means is to provide a lubricant between the metal going through the mold and the chill surface. The lubricant is supplied to the mold while the metal is being cast.

A slight sharp shoulder is provided at the proper zone levels in the mold passageway so that as the congealing metal passes this shoulder it experiences a complete release from the mold surface for the instant, as described in patent No. 2 527,545. This release of the frictional engagement between the mold wall and the bar in transit through the mold assures successful casting of steel continuously.

Other patents are pending on this particular continuous casting process being developed by N. P. Goss, Cleveland.

Lift Truck Film Produced

Concurrent with its announcement of five new model fork lift trucks, Towmotor Corp., Cleveland, is making available a sound-slide film, "What Makes It Tick?" designed to provide information to industry on the planning, design and engineering incorporated in the building of its fork lift trucks, and how the features of this equipment contribute to low-cost, efficient handling of materials.

The 15-minute film takes viewers behind the scenes to show basic fork lift truck construction features and demonstrates how new features have been developed to meet new and unusual industrial requirements. It illustrates how the company's fork lift truck is designed and built to keep pace with industry's prevailing high-speed production schedules, thereby cutting costs in the receiving, processing, storage, and distribution of materials.

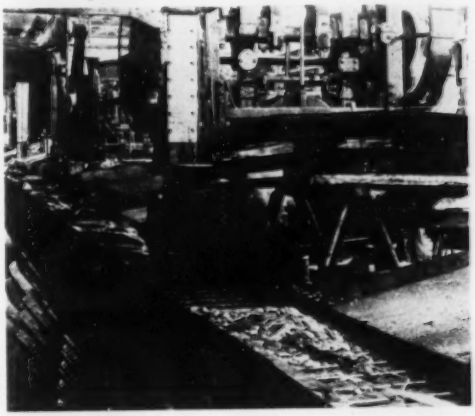
Basic construction features of a fork lift truck are described and illustrated in the film, with frame, body power plant, travel and lift mechanisms, etc., analyzed. Features responsible for easy handling and operator comfort, safety and convenience are explained.

Pipe Processing Speed Increased

High-speed heat processing line for normalizing welded steel pipe continuously under automatic control will be built for Lone Star Steel Co.'s plant at Lone Star, Tex., by Selas Corp. of America, Philadelphia. Construction is in accordance with the general plans of Boynton Co., Chicago, consulting engineers in the design and construction of the steel and pipe plant.

Designed to accommodate a wide range of pipe sizes, the line will be integrated with other pipe making equipment to form an uninterrupted production line. The uniform application of high-intensity radiant gas heat to all portions of the full pipe lengths after welding will relieve the hardened and stressed area adjacent to the weld. This rapid normalizing equipment is designed to exceed present welding speeds. Treatment produces improvement in the physical structure of pipe, including the transverse properties, an important factor in the higher operating pressures of oil and gas transmission pipelines.

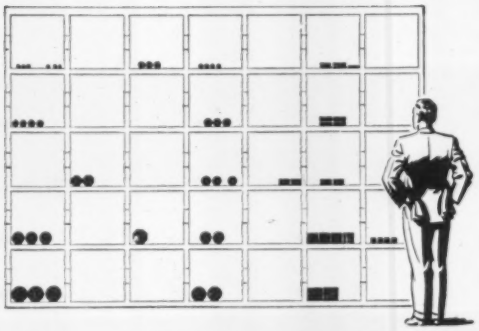
Conveyor Line Removes Scrap



SCRAP removal from nine 250-ton punch presses at Midland Steel Products Co., Cleveland, is being handled by a 236-foot run of hinged steel conveyor made by May-Fran Engineering Inc., Cleveland, eliminating all manual handling. Sheet steel scrap passes down a chute from each machine onto the belting which is driven by a variable speed drive at 24-40 feet per minute, depending on the number of presses in operation. An alligator shear, synchronized with the belt, cuts the scrap into 6 to 10-inch lengths for better packing. A 21-foot inclined unit moves cut scrap out of the building for car loading

OVER ONE HUNDRED YEARS OF CONTINUOUS SERVICE. ROUNDS, SQUARES, FLATS, HEXAGONS, OCTAGONS

BILLETS AND FORGINGS FOR PRODUCTION, TOOL ROOM AND MAINTENANCE REQUIREMENTS.



The present serious **STEEL SHORTAGE**

has reduced our warehouse stocks of HY-TEN and Standard alloy steels to a sub-normal level.

This inventory situation is, of course, very unsatisfactory but we are doing everything we possibly can to improve it.

Our aim is to allocate available stocks to our customers in the fairest and most equitable way possible.

Defense certifications on your warehouse orders will aid us greatly in supplying your alloy steel needs.

In the light of current conditions, we suggest that you put our metallurgical knowledge and experience to work for you.

It frequently happens that, when certain exact specifications are not available, our metallurgists can recommend entirely suitable substitute materials or alternate methods of manufacture and treatment.

Your nearby Wheelock, Lovejoy representative knows metallurgy. He stands ready to give you expert assistance in solving your problems.

Write today for your FREE COPY of the Wheelock, Lovejoy Data Book, indicating your title and company identification. It contains complete technical information on grades, applications, physical properties, tests, heat treating, etc.

131 Sidney St., Cambridge 39, Mass.
and Cleveland • Chicago • Detroit
Hillside, N. J. • Buffalo • Cincinnati

Cranes Use Electronic Scales

Electronic crane scales activated by Baldwin SR-4 bonded resistance wire strain gages simplify the weighing of massive parts and equipment for the transformer and allied product department of General Electric Co., Schenectady, N. Y. Resistance wire strain gage load cells of 300,000 pounds capacity are permanently installed in each of two overhead crane hooks.

A portable weight indicator and accessory reels of electric cord for connection to load cell units and convenient electric power supply outlet are carried on a rubber-tired hand truck.

The indicator has three scales: 0-50 tons, 50-100 tons, 100-150 tons. When two cells are used together to lift a load, each is read independently, using a switch on the indicator to select the load cell which is to be read. Chief use of the crane weighing system is to determine the weights of transformers both for shipping purposes and engineering data.

Instruments Save Technicians

Automatic control instruments that "practically think" are doing a big job in controlling factory processing operations, freeing technical manpower for more creative assignments, it was demonstrated at the National Instrument Exhibit in Houston. Complex plant operations that can run automatically or that require operating accuracies beyond human abilities are no longer visionary. G. M. Muschamp, chief engineer of the Brown Instruments Division, Minneapolis Honeywell Regulator Co., Philadelphia, stated, "It has been only in the past few years, since electronic servomechanisms outmoded the galvanometer, that automatic instrumentation has been used in the laboratory en masse," he said. "These developments may well be the forerunner of the nearly automatic plant. But make no mistake, we will need all the technical manpower that such automatism will free. We will need that manpower for more important work."

Capital expenditures for instrumentation of factories have been increasing more rapidly than for plant expenditures as a whole. This rate of expansion promises to accelerate and what is now a multi-million dollar technical business may well increase two or three fold in the next few years, he added. As an indication of how measuring instrumentation has grown, there were 68 plants engaged in this manufacturing activity in 1939 according to the Bureau of

NEW LINCOLN PLANT CREATED BY INCENTIVE-INSPIRED CO-ACTION IN DEVELOPING POSSIBILITIES IN PRODUCT

© LE Co. 1951

STEEL IS TWICE AS STIFF
. . . achieves equal rigidity with half the material

CONTRARY to erroneously preconceived notions, steel is twice as rigid as iron. In the simple demonstration shown in Fig. 3, a bar of steel deflects only half as much as a bar of iron stressed under equal load.

When designing a machine component for equal stiffness with steel, weight generally should be cut 50% or more. Otherwise, the design has not been developed far enough to fully utilize the superior physical properties of steel.

Welded steel has several additional benefits that improve product durability. Steel is 3 times stronger . . . has four times the resistance to fatigue. Steel is also ductile . . . withstands impact and shock without fracturing.

Your Lincoln Welding Engineer will gladly demonstrate how to apply these basic, cost-saving advantages to your products. Write The Lincoln Electric Co., Cleveland 1, O.

Fig. 3—Steel deflects only half that of iron *under equal loading. 50% of the material is generally required to duplicate stiffness.*

Fig. 5—Maintains alignment *to within .005" on this 120" long machine frame member. Machining time was cut from 8 hours to 2¼ hours and 170 pounds of metal saved on each frame member.*

Fig. 4—Design in steel cuts deflection 80%. *Originally the top for this planer deflected .070". With the present, welded steel construction, the deflection is only .014". Weight has been reduced from 410 pounds to 320 pounds.*

WELDED DESIGN ALWAYS IMPROVES PRODUCT AND LOWERS COST

Welded Steel Design

Fig. 1—Increases Rigidity 200% *by redesigning this End Bearing Bracket to welded steel. Cost is cut from $1.52 to 75 cents over construction shown in Fig. 2 . . .* a saving of 51%.

Original Design

Fig. 2—Original Construction *required 87% more metal than present welded steel design. Initial weight was 3¾ pounds . . . welded steel design (Fig. 1) weighs only 2 pounds.*

HERE IS PROOF

Machine Design Sheets are available to designers and engineers. Simply write on your letterhead to Dept. 610

THE LINCOLN ELECTRIC COMPANY

CLEVELAND 1, OHIO

Good service and good manners know no seasons or markets at Levinson Steel. We might temporarily be out of an item but we're never short on courtesy. You'll always find that the people you deal with at Levinson will gladly go out of their way to be helpful. They'll always say thanks for your order, and they'll never charge a premium for anything—NO MATTER WHAT THE MARKET OR THE SUPPLY.

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STEEL SALES CO.

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STEEL • ALUMINUM • CORRUGATED SHEETS • CORRULUX TRANSLUCENT PANELS
GRATING • WELDING MACHINES & ELECTRODES • STANDARDIZED METAL BUILDINGS

20TH AND WHARTON STS. S. S. PITTSBURGH, PA.

Census. Today there are approximately 500.

The galvanometer, once the wonder of an early age in instrument recording and analysis, had limitations for directing automatic action which are overcome by electronic devices. The substitution of an electronic amplifier contributes a more rugged instrument that is not so easily damaged by inexperienced operators or adverse operating conditions.

Adaptations of these techniques learned in World War II to industrial process control instruments are revolutionizing the factory, Mr. Muschamp observed. For a long time the army engineer and the factory engineer worked in air-tight compartments without knowing enough of what the other was doing. Now the military engineers and physicists are joining forces with industrial engineers.

Magnetic Amplifier Application

First application of magnetic amplifiers to the control of a large high-speed winder drive is being made by Westinghouse Electric Corp. They will perform control functions formerly obtained by use of rotating regulators and, in some cases, electronic equipment. The new winder will handle heavy, 234-inch wide kraft board at operating speeds up to 5000 fpm at a southeastern paper mill.

Magnetic amplifiers will provide voltage regulation of the system and current-limit control during the winder's acceleration and deceleration, as well as constant-tension regulation of the braking generator with provision for inertia compensation.

The magnetic amplifier is a static device, consisting of electric coils on an iron core, something like a transformer. It has no bearings, commutator, brushes, or electronic tubes, reducing control maintenance to a minimum.

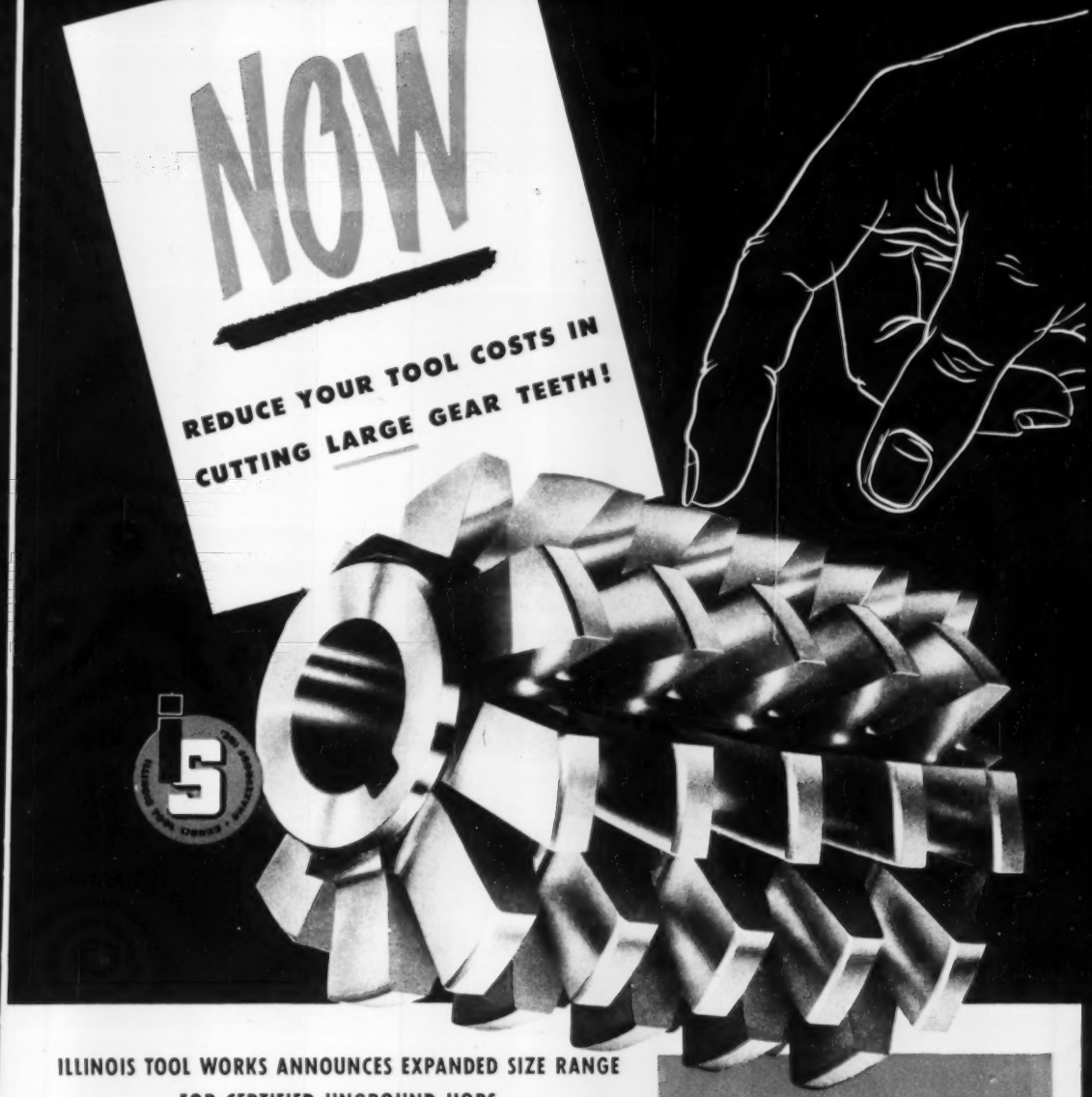
Compressor, Blower Data

Comprehensive data on three types of centrifugal blowers and compressors: Multistage, single stage, end suction and single stage double suction are contained in bulletin No. 0500 published by De Laval Steam Turbine Co. Units made by the company range from 1000 to 150,000 cfm for pressures to 150 psi and above. Special units for higher pressure and for service at operating pressures to 1000 psig can be built.

Information in the bulletin is arranged in four major sections: Application data, design and construction, drives and engineering data. The en-

NOW

REDUCE YOUR TOOL COSTS IN CUTTING LARGE GEAR TEETH!



ILLINOIS TOOL WORKS ANNOUNCES EXPANDED SIZE RANGE FOR CERTIFIED UNGROUND HOBS

3 D.P. TO 18 D.P. IN STOCK!

. . . up to 6 inches in diameter and with tapered holes where required. Now you can apply the proven advantages of *Certified* Unground Hobs—low original cost, reliable accuracy and longer sharpening life—over a greatly increased size range. Write today for complete information.

Remember, every *Certified* Unground Hob is shipped with the automatically produced Toolgraph* Chart, your certificate of accuracy!

SEND FOR YOUR FREE COPY OF THIS BOOKLET NOW!

. . . see the revised Metal Cutting Tool Institute tolerances for all classes of hobs. Detailed information will show you how you can reduce gear cutting tool costs with *Certified* Unground Hobs.

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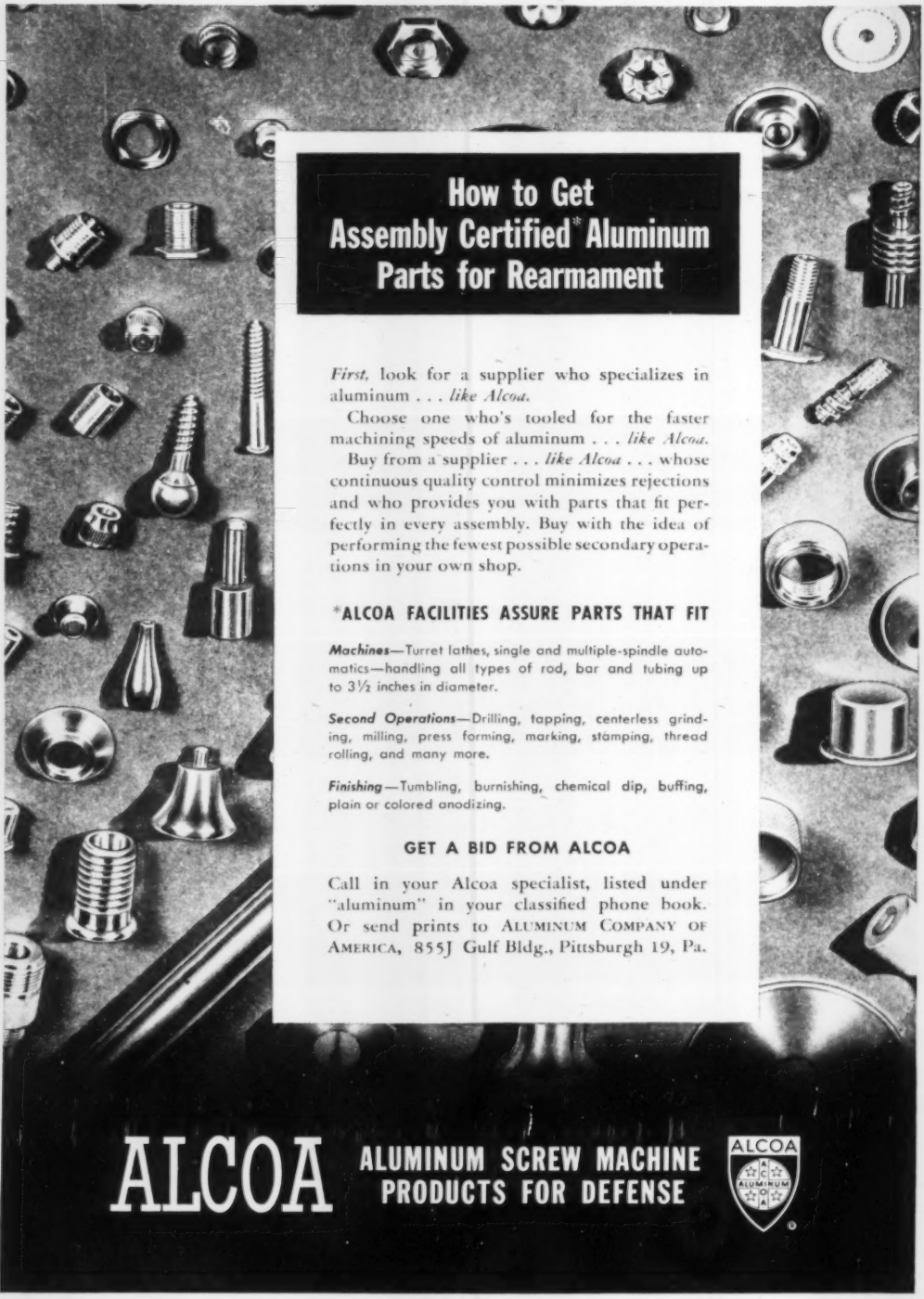
TOOL WORKS

2501 North Keeler Avenue, Chicago 39, Illinois

"HEADQUARTERS FOR ENGINEERED CUTTING TOOLS"

*T.M. Reg. U.S. Pat. Off.



How to Get Assembly Certified* Aluminum Parts for Rearmament

First, look for a supplier who specializes in aluminum . . . *like Alcoa.*

Choose one who's tooled for the faster machining speeds of aluminum . . . *like Alcoa.*

Buy from a supplier . . . *like Alcoa* . . . whose continuous quality control minimizes rejections and who provides you with parts that fit perfectly in every assembly. Buy with the idea of performing the fewest possible secondary operations in your own shop.

*ALCOA FACILITIES ASSURE PARTS THAT FIT

Machines—Turret lathes, single and multiple-spindle automatics—handling all types of rod, bar and tubing up to 3½ inches in diameter.

Second Operations—Drilling, tapping, centerless grinding, milling, press forming, marking, stamping, thread rolling, and many more.

Finishing—Tumbling, burnishing, chemical dip, buffing, plain or colored anodizing.

GET A BID FROM ALCOA

Call in your Alcoa specialist, listed under "aluminum" in your classified phone book. Or send prints to ALUMINUM COMPANY OF AMERICA, 855J Gulf Bldg., Pittsburgh 19, Pa.

ALCOA ALUMINUM SCREW MACHINE PRODUCTS FOR DEFENSE

ALCOA ALUMINUM

gineering data section covering 17 pages contains curves, formulas and examples for computing compression of gases and pipe friction. Copies of the bulletin are available from De Laval Steam Turbine Co., Trenton 2, N. J.

Stainless Fabrication Stepped Up

Upwards of 300,000 pounds of stainless steel process equipment is the total fabricated by Standard Steel Corp., Los Angeles. The total includes pressure vessels, heat exchangers, large diameter piping and similar process equipment. Many items are intricate in shape and are fabricated from ¼, ⅜ and ½-inch stainless plate.

Processing surfaces on many of these items must be kept free of chemical contamination. To achieve this, workmen thoroughly scrub stainless plate as it is received from the supplier and apply a spray coating of rubber-like compound which stays on the surface through all stages of fabrication. Just before shipment it is

Furnace Door Repair Simplified

SPECIAL spring clips and rivets with countersunk heads to reinforce the lining and give it satisfactory service life are features of a new type of door for use in open hearths and other high temperature furnaces. Blaw-Knox Co., Pittsburgh, developed the design that eliminates the need for welding in new studs when the door is relined. Method of attaching rivets to the backplate is shown in the photograph. The removable peep-hole ring is replaced by rotating it counter-clockwise; new ring is set in place and then turned clockwise until it is locked

For repetitive cutting . . .

THIS COMBINATION SAVES TIME AND MONEY

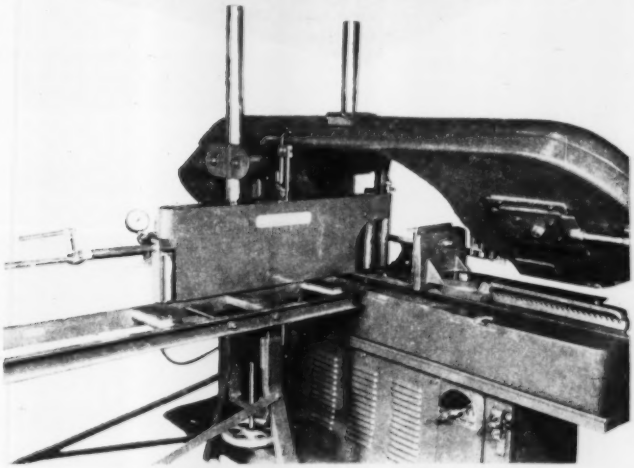
Wells No. 12 Metal Cutting Band Saw and *Wells-O-Bar* Feed Master

ANY quantity of identical lengths of bar stock are cut automatically in a Wells No. 12 Heavy Duty Metal Cutting Band Saw equipped with a Wells-O-Bar Feed Master.

In operation, the cutting head of the saw descends at a rate governed by a predetermined blade pressure setting. At the completion of each cut, the head automatically rises to a preset height and the stock is automatically projected for the next cut. The machine requires no attention except for reloading. The saw is powered by two electric motors (3/4 and 1/3 H.P.); the feed requires air at 60 to 80 psi. Capacity of the saw is 12¾" O.D. for rounds, 12" x 16" rectangular; standard feed will project up to 17".

The feed mechanism does not interfere with the use of the saw for making single cuts. Saw and feed can be purchased separately or as a combination. The feed unit can easily be attached to horizontal band saws now in service.

Ask your Wells Dealer for complete information or write direct.



Wells saws

Wells

The Pioneers of Horizontal

METAL CUTTING BAND SAWS

WELLS MANUFACTURING CORPORATION
1515 FILLMORE ST., THREE RIVERS, MICHIGAN

You may think we're in the clouds . . . but DIMENSIONAL ACCURACY CAN benefit your product.

READ THESE down-to-earth FACTS!

BEER BOTTLES had a way of shattering during the capping operation. Now a Federal Dimension-Control Gage shows up any thin spots when the bottles are being made — saves bottles, beer, bottling time, and contributes to the safety of brewery personnel.

TIN CANS holding insecticide under pressure were leaking. By inspecting vital dimensions with a Federal Indicating Gage, the strength and tightness of the cans have been greatly improved, resulting in big savings to the manufacturer and wider acceptance for the product.

RUBBER TILE is another "non-precise" product now being controlled with Federal Gages. By gaging the rubber while it is calendered, the manufacturer obtains a product of uniform thickness, thus avoiding costly reprocessing of reject goods. The Federal Continuous-Measuring Gage also prevents wastage of rubber due to over-thick tiles.

These examples are typical of many manufacturers who have discovered it pays to give careful consideration to dimensional control. If you have ever said to yourself "Our requirements aren't accurate enough to need precision methods" — WATCH OUT! You may be paying a higher price than you think for scrap, rework, spoilage, breakage, wasted materials, etc.

Federal gage-engineers will be glad to show you how Federal Dimension-Control Gages can help you. Write for recommendations. FEDERAL PRODUCTS CORPORATION, 1219 Eddy Street, Providence 1, Rhode Island.

FEDERAL

Largest manufacturer devoted exclusively to designing and manufacturing all types of DIMENSIONAL INDICATING GAGES.

removed and the vessel or pipe is sealed to prevent contamination in transit.

On many items company engineers are able to meet close tolerance specifications considering the large size of the finished product. On one 7-foot diameter pressure vessel the spacing of the holes drilled into the flange at one end were held to a 0.002-inch tolerance. Products now being fabricated include pipe up to 40-inch diameter, pressure vessels 7 feet in diameter and 16 feet long and intricate reducing U sections of large pipe. Plate up to 1 inch in thickness can be worked by equipment in the shops.

Coke Ovens Repaired Hot

To minimize down time in making repairs to coke oven floors, a unique method is being used in making quick replacement. The floors are thoroughly cleaned of slag and coke and carbon particles are burned out. Then R & I Super No. 3000 made by Refractory & Insulating Corp., New York, is mixed with water into a mortar, thin enough to flow down a chute and be distributed evenly over the floor to the normal level of the brick floor. One half the floor is poured from each side.

Because of the residual heat in the oven, the refractory cement sets immediately to flint-like hardness and remains abrasion resistant to conditions resulting from high temperature in the oven. Pusher rams are run through the oven several times to level off any blisters that may form in the rapidly hardening cement. Two-inch wooden planks are then placed on the floor providing a charcoal lubricant for pushing the first load of coke along the new floor. Doors are sealed with a clay known as "luting mud", the oven is charged with coal and put back into operation.

Aid for Better Arc Welds

A pocket size booklet containing useful arc welding information, is now available free from Hobart Brothers Co. It gives information on metals and electrodes, types of electrodes, four essentials of proper welding procedures, color marking for identification of electrodes, types of joints, typical positions, standard steel shapes, characteristics of the fillet weld, causes of common welding troubles, average electrode consumption, handy reference information, and complete information for using the company's electrodes. Send for copy to Hobart Brothers Co., Box EW-161S, Troy, O.

CALENDAR
OF MEETINGS

September 24-25, American Coke & Coal Chemicals Association: Annual fall meeting, Skytop Lodge, Skytop, Pa. Association address: 711 14th St. NW, Washington. Executive secretary: Samuel Weiss.

September 24-26, National Truck Body Mfrs. & Distributors Association: Annual convention and suppliers exhibit, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 346 Connecticut Ave. NW, Washington. Secretary-manager: Shipley D. Burton.

September 25-28, American Society of Mechanical Engineers: Fall meeting, Hotel Radisson, Minneapolis. Society address: 29 W. 39th St., New York. Secretary: C. E. Davies.

September 26-29, Marking Device Association: National convention, Edgewater Beach Hotel, Chicago. Association address: 134 N. La Salle St., Chicago. General manager: E. F. Way.

September 27-30, Multiple V-Belt Drive & Mechanical Power Transmission Association: Annual meeting, The Broadmoor, Colorado Springs, Colo. Association address: 7 W. Madison St., Chicago 2. Executive Secretary: Harry P. Dolan.

October 1-2, American Machine Tool Distributors Association: Annual meeting, Chalfonte-Haddon Hall, Atlantic City, N. J. Association address: 1900 Arch St., Philadelphia. Executive secretary: Thomas A. Fernley Jr.

October 1-4, Association of Iron & Steel Engineers: Fall meeting, Sherman Hotel, Chicago. Association address: 1010 Empire Bldg., Pittsburgh. Managing director: T. V. Ess.

October 2-4, Society of Industrial Packaging & Materials Handling Engineers: Exposition and "short course," Hotel Cleveland, Cleveland. Society address: 20 W. Jackson Blvd., Chicago. Secretary: H. E. Brill.

October 3-5, Pressed Metal Institute: Fall meeting, Drake Hotel, Chicago. Institute address: 13210 Shaker Square, Cleveland 20. Managing director: Orrin B. Werntz.

October 8-12, National Hardware Show: Grand Central Palace, Atlantic City, N. J. Managing director: Frank Yeager.

October 8-13, Concrete Reinforcing Steel Institute: Fall meeting, Grove Park Inn, Asheville, N. C. Institute address: 38 S. Dearborn St., Chicago 3. Managing director: H. C. Delzell.

October 9-12, The Electrochemical Society Inc.: Centennial—Fall convention. Hotel Statler, Detroit. Society address: 235 W. 102nd St., New York 25. Secretary: Henry B. Linford.

October 10-12, Porcelain Enamel Institute Inc.: Shop practices forum, Deshler-Wallick Hotel, Columbus, O. Institute address: 1010 Vermont Ave. NW, Washington. Secretary: Edward Mackaser.

October 11, American Iron & Steel Institute: Regional technical meeting, Hotel Warwick, Philadelphia. Institute address: 350 Fifth Ave., New York. President: Walter S. Tower.

October 12-14, Metal Treating Institute: Annual meeting, Detroit. Institute address: 271 North Ave., New Rochelle, N. Y. Executive secretary: C. E. Herington.

October 13-14, American Welding Society: Annual meeting, Book-Cadillac Hotel, Detroit. Society address: 33 W. 39th St., New York 18. Secretary: J. G. Magrath.

October 13-14, American Society for Metals: Annual seminar, Hotel Statler, Detroit. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 13-17, Packing Machinery Manufacturers Institute: Fall meeting, Mid Pines Club, Southern Pines, N. C. Institute address: 342 Madison Ave., New York 17. Secretary: Helen L. Stratton.

October 14-18, American Hardware Manufacturers Association: Fall meeting, Marlbor-

(Continued on p. 124)

"On steps and ramps around the shop,

Where slips could spell disaster,

Safe, lasting, non-skid Multigrip

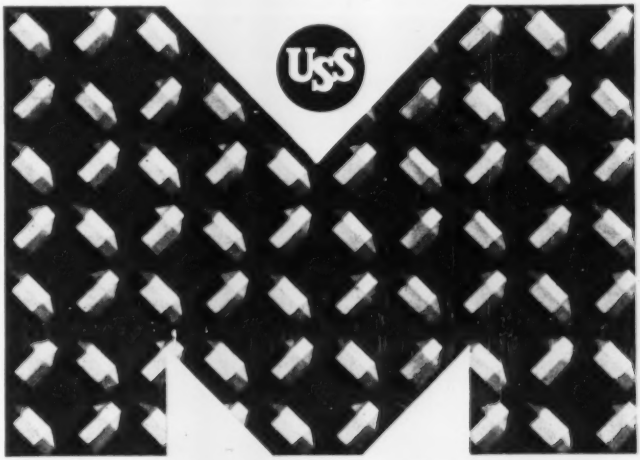
Keeps traffic moving faster!"

U·S·S MULTIGRIP FLOOR PLATE is comfortable to walk on, comfortable to work on. And, wet or dry, Multigrip offers skid resistance and positive traction in every direction . . . cuts down on accidents due to slips and falls. The sloping sides of the scientifically-designed risers make it impossible to trip on them. Multigrip is attractive in appearance. Easy to clean. Permanent. *Safe.*

Install U·S·S Multigrip wherever sure footing is essential. On ship decks and walkways. On machinery steps and platforms. Or to cover entire factory floors.

Get further information about Multigrip from your nearest steel warehouse or write to us direct.

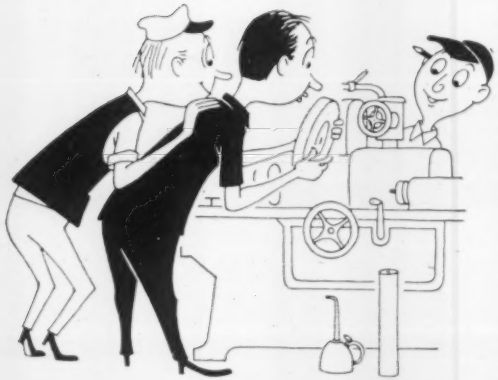
United States Steel Company, Pittsburgh • Columbia Steel Company, San Francisco
Tennessee Coal, Iron & Railroad Company, Birmingham • United States Steel Export Company, New York
United States Steel Supply Company, Warehouse Distributors, Coast-to-Coast



U·S·S MULTIGRIP FLOOR PLATE 1-5143

UNITED STATES STEEL

There's something worthwhile going on here!



SIMONDS ABRASIVE CO.

Grinding Wheels

A Simonds Abrasive Company grinding wheel . . . that's what's going on. It's going on the business end of the grinding machine to end a troublesome bottleneck. Like all Simonds wheels it can be depended on to give top results on the job. It's part of a complete line containing everything you need in grinding wheels, mounted wheels and points, segments and abrasive grain . . . efficient production tools, accurately specified and made under complete quality control by Simonds Abrasive Company, a major manufacturer of grinding wheels for almost 60 years. Write for free data book and name of your Simonds distributor.

SIMONDS ABRASIVE CO., PHILADELPHIA 37, PA. BRANCH WAREHOUSES: CHICAGO, DETROIT, BOSTON
DISTRIBUTORS IN PRINCIPAL CITIES

Division of Simonds Saw and Steel Co., Fitchburg, Mass. Other Simonds Companies: Simonds Steel Mills, Lockport, N. Y., Simonds Canada Saw Co., Ltd., Montreal, Que. and Simonds Canada Abrasive Co., Ltd., Arvida, Que.

(Continued from p. 123)

ough-Blenheim Hotel, Atlantic City, N. J. Association address: 342 Madison Ave., New York 17. Secretary: Arthur L. Faubel.

October 15-17, American Gas Association: Annual meeting, Kiel Auditorium, St. Louis. Association address: 420 Lexington Ave., New York 18. Secretary: Kurwin R. Boyes.

October 15-18, Society for Non-Destructive Testing Inc.: Annual meeting, Hotel Detroiter, Detroit. Society address: Box 710, Evanston, Ill. President: W. E. Thomas.

October 15-19, American Society for Metals: National Metal Congress & Exposition, Statler Hotel, Detroit, and Michigan State Fairgrounds. Society address: 7301 Euclid Ave., Cleveland. Secretary: W. H. Eisenman.

October 15-19, The World Metallurgical Congress: Hotel Statler, Detroit. Sponsored by American Society for Metals. Manager: W. H. Eisenman; director: Dr. Zay Jeffries.

October 16-19, Scientific Apparatus Makers Association: Record controller & midyear meeting, Seaview Country Club, Absecon, N. J. Association address: 20 N. Wacker Drive, Chicago 6. President: Kenneth Anderson.

October 17-18, Steel Shipping Container Institute Inc.: Fall meeting, Pierre & Hampshire House, New York. Institute address: 570 Lexington Ave., New York 22. Secretary: L. B. Miller.

October 18-20, Anti-Friction Bearing Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: 60 E. 42nd St., New York 17. Secretary-manager: H. O. Smith.

October 18-20, National Association of Corrosion Engineers: Annual meeting, south-central region, Corpus Christi, Tex. Association address: 919 Milam Bldg., Houston 2. Executive secretary: A. B. Campbell; meeting chairman: George A. Mills.

October 19-20, American Society of Tool Engineers: Semi-annual directors' meeting & south-central regional meeting, Vendome Hotel, Evansville, Ind. Society address: 10700 Puritan Ave., Detroit 21. Executive secretary: Harry E. Conrad.

October 22-24, American Mining Congress: 1951 metal and nonmetallic mineral mining convention, Biltmore Hotel, Los Angeles. Congress address: Ring Bldg., Washington 6. Secretary: Julian D. Conover.

October 22-24, American Standards Association: Annual meeting & national standardization conference, Waldorf-Astoria Hotel, New York. Association address: 70 E. 45th St., New York. Secretary: G. F. Hussey Jr., Adm., USN, Ret.

October 22-24, Packaging Institute: Fall meeting, Commodore Hotel, New York. Institute address: 342 Madison Ave., New York 17. Secretary: Laurence V. Burton.

October 22-25, American Institute of Steel Construction Inc.: Fall meeting, The Greenbrier, White Sulphur Springs, W. Va. Institute address: 101 Park Ave., New York 17. Executive vice president: L. Abbott Post.

October 22-25, The Wire Association: Annual convention, La Salle Hotel, Chicago. Association address: 500 Main St., Stamford, Conn. Executive secretary: Richard E. Brown.

October 22-26, American Association of Electrical Engineers: General fall meeting, Hotel Cleveland, Cleveland. Association address: 33 W. 39th St., New York 18. Secretary: H. H. Henline.

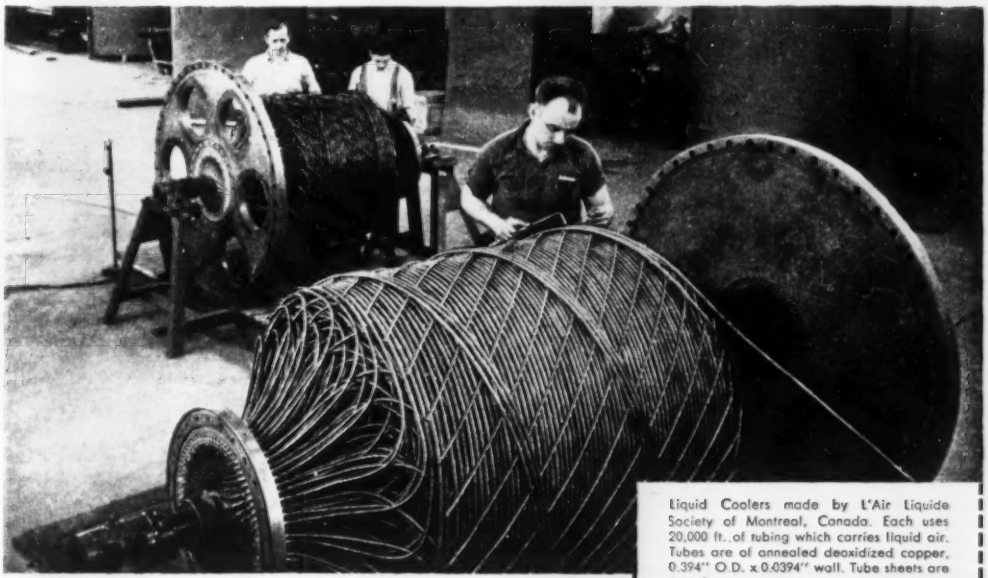
October 25-26, Gray Iron Founders Society Inc.: Fall meeting, Edgewater Beach Hotel, Chicago. Society address: 210 National City—E. 6th St. Bldg., Cleveland. Executive vice president: Donald H. Workman.

October 28-30, Conveyor Equipment Manufacturers Association: Fall meeting, The Homestead, Hot Springs, Va. Association address: 1129 Vermont Ave., Washington 5. Executive vice president: R. C. Sollenberger.

October 29-31, American Gear Manufacturers Association: Semi-annual meeting, Edgewater Beach Hotel, Chicago. Association address: 302 Empire Bldg., Pittsburgh 22. Secretary: Newbold C. Goin.

COPPER

—most versatile metal known to Industry



Liquid Coolers made by L'Air Liquide Society of Montreal, Canada. Each uses 20,000 ft. of tubing which carries liquid air. Tubes are of annealed deoxidized copper, 0.394" O.D. x 0.0394" wall. Tube sheets are cast bronze.

This equipment, known as Liquid Coolers and used in the production of oxygen, is made of deoxidized copper tubing. The combination of properties demanded of copper—high thermal conductivity, ductility and easy workability, strength, resistance to corrosion—illustrates the versatility of copper and explains its great usefulness to industry.

Copper and copper alloys offer the useful properties required for building efficient and economical processing equipment. Depending on composition, they possess combinations of strength, corrosion resistance, high thermal and electrical conductivity, plus free machining, easy forming, and good welding characteristics.

The experience and help of Anaconda's Technical Department are always available to you in selecting the right copper or copper alloy for your needs or for any problem connected with these metals. The American Brass Company, Waterbury 20, Connecticut. In Canada: Anaconda American Brass Ltd., New Toronto, Ontario.

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New Products and Equipment

Trucks Work in Close Quarters

Gasoline fork trucks in a series combining low weight, low overall height and high maneuverability for operation in close quarters are offered by Philadelphia Division, Yale & Towne Mfg. Co., 11000 Roosevelt Blvd., Philadelphia 15, Pa. Called the

"Trucker" series, they are designed specifically for operation in and around highway motor trucks and freight cars. Trucks are available in capacities up to 2000 pounds and are only 68 inches high when telescopic lift is collapsed. In duplex models, the truck can elevate its forks 54 inches before secondary channels rise to increase the height.

Clutch, accelerator, gearshift, and brake are in conventional positions while controls for hoisting, lowering and tilting the forks are located in close proximity to the steering wheel. Hydraulic brakes also follow automotive practice. Power impulses from the engine are transmitted through triple reduction spur and hypoid gears to the drive axle. Drive axle is enclosed in an oil-tight housing and is the full-floating type with involute spline drive shafts.

Check No. 1 on Reply Card for more Details

Gear Box Eases Drilling

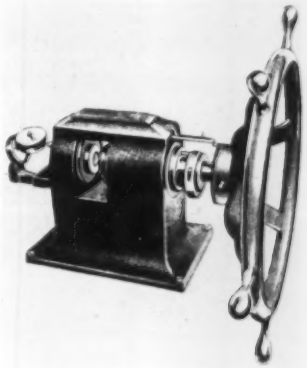
Newage International Inc., 235 E. 42nd St., New York 17, N. Y., is offering a two-speed gear box that permits operators of its Desoutter drill to put through a small pilot hole to facilitate drilling ½ or ⅝-inch holes. Output of the motor is 0.35 hp on a consumption of 490 watts; weight is 9¼ pounds.

Gears are of heat treated chrome-nickel-molybdenum steel, mounted on ball or roller bearings. Thrust of the chuck spindle is taken by a heavy duty double-row ball bearing, the other end of the spindle running on a roller bearing. To attain proper cooling, a straight-through airflow leads the inlet air directly over the commutator and over both inner and outer sides of the field. Its centrifugal fan assures cooling under full load conditions. Body casing is pressure die-cast silicon-alloy. Two condensers are fitted in the body which, when combined with the motor design, result in a motor completely free from radio and short wave interference.

Check No. 2 on Reply Card for more Details

Erichson Tester Introduced

J. Arthur Deakin & Son, 150-28 Hillside Ave., Jamaica 2, N. Y., representatives for George H. Alexander Machinery Ltd., are introducing the Alexander sheet metal tester for making the Erichsen test. Test determines the actual workability of ferrous, non-



ferrous and fine metal sheet and strip to the point of fracture. Tester handles material up to 5/64-inch thick providing effective means for material controls between suppliers and users. Specifications for quality of sheet or strip can be established by agreeing on certain minimum standard values.

In operation, a test piece is clamped between two dies and held so the metal has play and can flow while a perfect round-end tool is moved forward gradually by the handwheel until fracture occurs. Operator constantly observes the image of the test piece in a mirror, and when fracture appears, the depth of the impression is read directly from a micrometer scale. Readings can be obtained accurately to 0.0004-inch. Test pieces of 3½ inches square and sheet or strip up to 2 7/16 inches wide can be tested with standard tools. Additional interchangeable tools can be supplied for checking narrow strip up to 25/64, ¾, and 1 inch wide.

Check No. 3 on Reply Card for more Details

Internal Type Purifier

First in a new line of internal-type purifiers introduced by V. D. Anderson Co., 1935 W. 96th St., Cleveland 2, O., is made for application in steam drums, flash tanks, evaporators, packed towers, bubble-cap towers, deodorizers and stills. The unit will deliver vapor with 1.0 parts per million or less of total solids.

In operation, entrainment is removed in three stages: 1. Vapor enters top of purifier as far away from liquid level as possible, passes downward in rotary motion developing centrifugal force; 2. rapid rotation is reduced to slow linear flow; 3. further centrifugal force is developed, effecting practically complete removal of entrainment before vapor continues up and out the evaporator outlet. Entrainment is discharged below the liquid level by means of ejects. Units are available in a complete range of sizes in fabricated steel, structural steels and other alloy metals.

Check No. 4 on Reply Card for more Details

Charger Conserves Space

A motor-generator battery charger designed for mounting on balconies or shelves to save floor space, is being offered by small and medium motor divisions, General Electric Co.,

Schenectady 5, N. Y. The unit is used for charging batteries in driver-lead and small driver-ride lift trucks and accommodates lead-acid batteries of 6-19 cells and nickel-iron-alkaline batteries of 10-13 cells. It weighs 190 pounds and can be installed on a shelf 6¾ x 8¼ inches. The charger is timer controlled; voltage and current are adjustable.

This single-circuit equipment operates on 3-phase, 60-cycle, ac power and has generator and motor overload protection against excessive currents. Its design incorporates several self-regulating features recommended

by Industrial Truck Association, including automatic disconnection of charger from power line and opening of charging circuit in case of power interruption, automatic restart of charger upon resumption of power supply, automatic control of charging rate under the modified constant voltage charging system and automatic cutoff of battery and shutdown of charger when battery is charged.

Check No. 5 on Reply Card for more Details

Direct Coupled Amplifier

A direct coupled amplifier designed for use in standard 19-inch rack and having a 7-inch high front panel is being offered by Brush Development Co., Instrument Division, 3405 Perkins Ave., Cleveland 14, O. The instrument, designated model BL-962 will be used in studies of such static or dynamic conditions as strains, displacements, pressures, light intensities, temperatures and ac or dc voltages or currents. Voltage gain of the instrument, approximately 1000 times, is sufficient to give one millimeter of deflection on the oscillograph chart per millivolt input. Zero signal drift amounts to not more than one chart millimeter per hour. The control panel on the face of the unit contains an attenuator with five factor-of-ten positions, gain control, calibrating meter and controls for determining input voltages. When the amplifier is used with the penmotor the frequency response is essentially linear from dc to 100 cycles per second.

Check No. 6 on Reply Card for more Details

Press Safety Device Modified

Pull-back adjustment, controlling location of punch press operator's hands, can now be made while standing on the floor as a result of improvements developed for its Possons safety device by Positive Safety Mfg. Co., 4411 Perkins Ave., Cleveland 14, O. One adjustment, consisting of a knurled nut on a 10-inch screw, takes care of both hands. Turning the nut moves the clip into the pull-back position. A ball-seated arrangement prevents the nut from slipping or turning while in use. After adjustment is made, the hinged, perforated cable guard is closed and may be locked.

Another modification is use of solid pins to replace old-style cotter pins for adjusting the ram connection rod. These are held securely in place by a 2-inch length of coil spring. Holes are capped on opposite sides to prevent the job setter from inserting both pins on the same side of the rod and so preventing use of the spring.

Check No. 7 on Reply Card for more Details

Rollers Make Focusing Easier

Ball bearings and rollers throughout the focusing system are one feature in a line of laboratory microscopes being offered by Bausch & Lomb Optical Co., Rochester 5, N. Y. This instrument, called the Dynoptic Labroscope, also features a low position fine adjustment and a mechanical stage with low controls that enables the operator, after setting the coarse adjustment, to rest his hand on the table and manipulate other controls in a relaxed position.

A ball bearing on the horizontal shaft of the low position fine adjustment assures effortless turning of the focusing knob. Two rollers on the lever transfer horizontal movement of the screw to vertical travel of the focusing slide. The slide is fitted with ball bearings assembled in pressure plates. Finally, the nosepiece has ball bearings around its outer rim and a ball stop. Substage equipment includes a variable focus condenser in a tubu-

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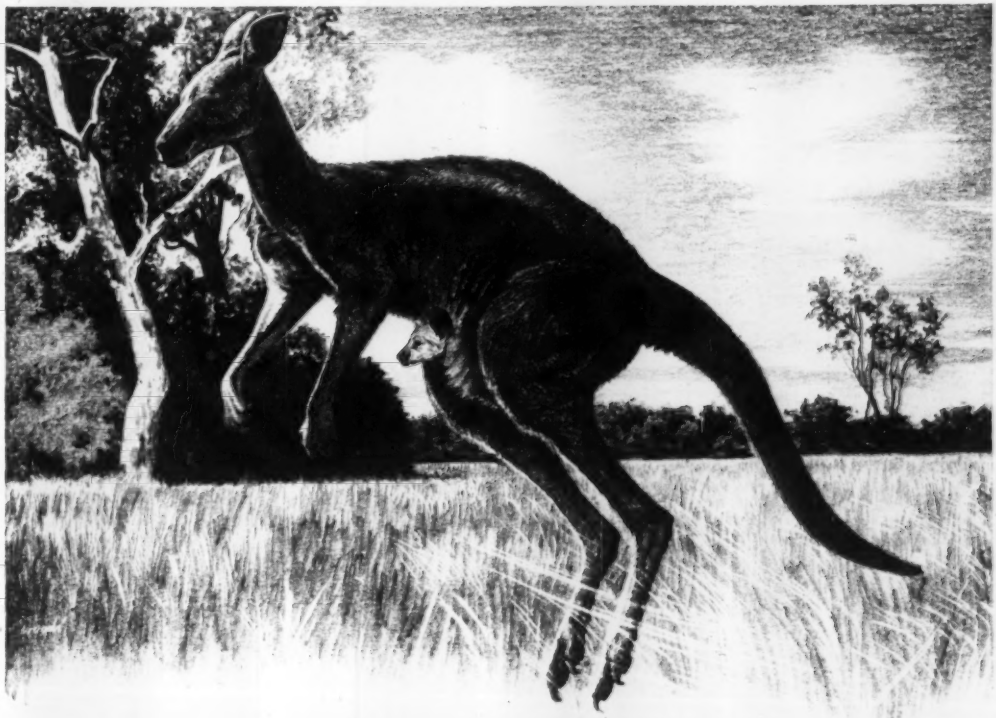

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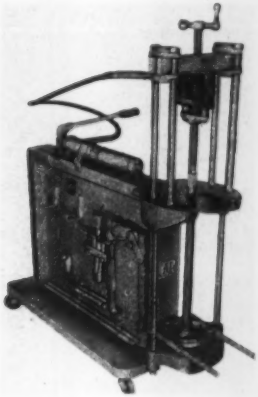
lar mount that does not require a rack and pinion. A substage illuminator is available that can be used integrally with the microscope in place of the mirror.

Check No. 8 on Reply Card for more Details

Tote Pulls Tools To Job

A portable Hydra-Tote that holds a complete hydraulic pulling system and may be easily moved to any spot in the shop, is offered by the Owatonna Tool Co., 398 Cedar St., Owatonna, Minn. Ideal for maintenance work, the tool provides a place for



permanent steel hangers for basic items and a tray for extra parts to reduce the danger of losing or misplacing tools. It is of welded steel construction, 32 inches high, 36¼ inches long, 16 inches wide at the base and 4 inches wide at the top. It has a 10½-inch clearance between the press uprights, 11-inch clearance from the ram to top of the press plate and 34 inches from top of press plate to floor. Vertical adjustment is possible with interchangeable legs in the upper press frame and three easy adjustments in the lower press frame. Three-inch rubber casters assure mobility.

Check No. 9 on Reply Card for more Details

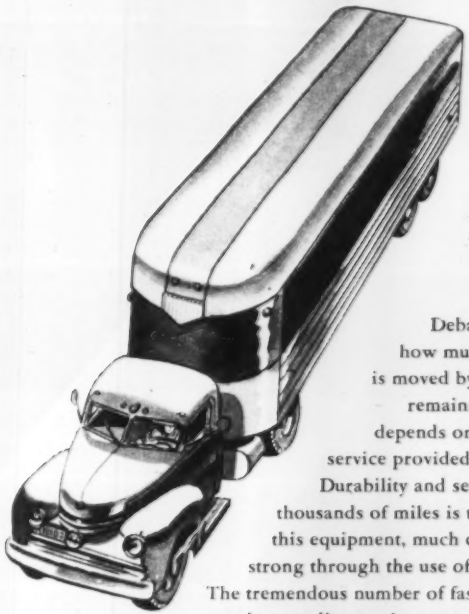
Air Unit Saves Cutting Time

An air operating unit that automatically moves cutters at predetermined speeds has been developed by Heston & Anderson Division, St. Paul Foundry & Mfg. Co., Fairfield, Iowa. The unit can be installed on any of the company's swing cutoff machines now in use.

Operator's time and motion savings result from setting the unit for desired speed, at which it will travel only the required distance to cut off

Mile After Mile . . . "

Wherever roads stretch over the countryside linking village, town, city, seaport—there you will find the familiar welcome sight of the Truck-Trailer.



Debate may wage warm as to how much of the nation's freight is moved by Truck-Trailer. The fact remains that much of the nation depends on the fast and economical service provided by these sturdy vehicles. Durability and service over thousands and thousands of miles is the accepted standard for this equipment, much of it assembled and made strong through the use of Sterling Bolts and Nuts. The tremendous number of fastenings required for this equipment dictates, in many cases, the selection of the Sterling Bolt Company as a primary source because Sterling Bolt, for more than 30 years, has been a dependable supplier of bolts and nuts to the volume production industries—and this includes the great Truck-Trailer Industry.

Sterling Bolt Company is a member of the Truck-Trailer Mfgrs. Association.

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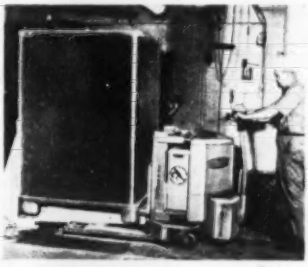
the stock, then return to a position behind the guide rail clearing the table for quick unloading and reloading. Movement is controlled by a lever or button and is limited to one cycle with each press of the button

Check No. 10 on Reply Card for more Details

Jackstacker Totes Bins Easily

Addition to the materials handling line of Lewis-Shepard Products Inc., 194 Walnut St., Watertown 72, Mass., is its Jackstacker, made especially for handling tote bins. This lift is made in telescopic and nontelescopic models with capacity for 4000-pound



loads up to 48 inches long. Nontelescopic model has a fork elevation of 53 inches and telescopic model 77 inches to facilitate double-decking bins in storage areas. Lifting forks have an 11-inch opening to give clearance on either side of the tote bin tilt racks. Both front and rear wheels and stabilizer casters are rubber tired to provide floor protection.

Check No. 11 on Reply Card for more Details

Gravity Filter Removes Solids

Continuous self-cleaning gravity filter, for use in grinding and machining operations, is being marketed by Delpark Corp., Lebanon, Ind. It is designed to filter solids from liquids that flow by gravity through filter material and discharge solids in a relative dry state into an outside container. The filter material, fed from a roll, rests on, and conforms to, a flat endless conveyor of open construction. Sloping sides form a shallow pool of the conveyor and an inclined discharge ramp provides for removal of filtered solids.

Dirt laden liquid is fed onto the filter material, the liquids passing through the solids and remaining on the surface. When the flow through the filter material is reduced by the solids held upon it, the liquid level rises. This section raises a float which actuates a switch causing the conveyor to carry the filter material forward and bring clean filtering ma-

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terial under the incoming dirty liquid. The float drops as the level of the liquid lowers, and the conveyor stops until the need for clean filter material again causes the liquid level to rise and the cycle is repeated. The entire process is fully automatic.

Check No. 12 on Reply Card for more Details

Pneumatic Tire Lift Trucks

Supplementing its line of fork lift trucks in capacities from 2000 pounds to 6000 pounds, Buda Co., Harvey, Ill., is introducing models FPB20-24 and FPB20-15. Features of these models include carriage mounted on adjustable side thrust rollers to eliminate wear; extra strength, self-aligning mast; single lever, two speed for-

ward and two speed reverse gear shift; and a complement of gages and switches on front vision instrument panel.

Trucks are powered by 4-cylinder, 61-cubic inch displacement engines, are available in five standard masts with lift of 72, 84, 108, 114 and 120 inches. Inch-pound capacity of the model 20-24 is 74,500; of the model 20-15, 56,500.

Check No. 13 on Reply Card for more Details

Automatic Clarifier System

Design of Houdaille automatic clarifier system, which removes abrasives from machine tool coolant and cleans its own filtering screens in automatic cycles, is announced by Honan-Crane Corp., Lebanon, Ind. Equipment removes particles as small as 5 to 10 microns, consists of a multiple-screen clarifier, blowdown tank with conveyor, and an automatic control panel. Contamination, removed from clarifier screens by blowdown action, settles in V-bottomed blowdown tank and is removed to disposal point by built-in, tube-enclosed chain conveyor.

System is designed for plant op-

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Kennametal cemented carbide tools are made by processes that are exclusive and expensive, but which are worth far more than the cost . . . because they assure a tool material of consistent soundness.

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MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES AND CUTTING TOOLS THAT INCREASE PRODUCTIVITY

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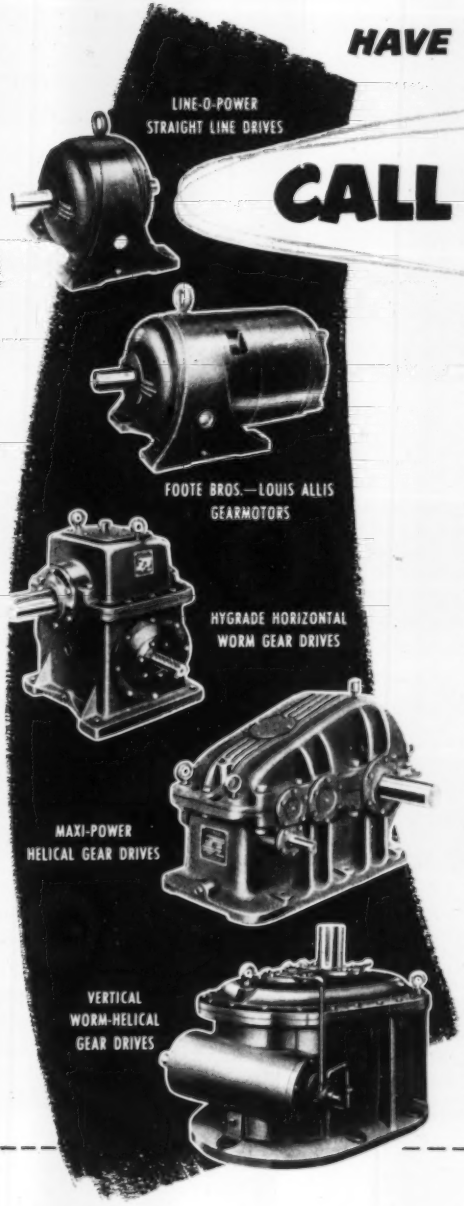

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Economical in original cost and operation. Duti-Rated Gears have file-hard tooth surfaces and ductile cores, assuring long life. Double or triple reductions, with ratios from 5 to 1 up to 238 to 1 and capacity range from 1 up to 200 horsepower.

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A compact line of gearmotors in 17 sizes in single, double and triple reductions, incorporating Duti-Rated Gears that assure long wear life and maximum load-carrying capacity. Available with Louis Allis open drip-proof, splash-proof, enclosed and explosion-proof motors.

HYGRADE WORM GEAR DRIVES

Heavy duty drives with precision worm gearing that assures high efficiency and load-carrying capacity. Horizontal, vertical and Hytop (extended shaft) types. Ratios from 4⅛ to 1 up to 4,108 to 1. Capacity up to 260 horsepower.

MAXI-POWER HELICAL GEAR DRIVES

Heavy-duty helical gear drives. Available in single reduction units, ratios up to 9.91 to 1; capacities up to 1,550 horsepower; double-reduction units, ratios from 9.32 up to 71 to 1, capacities to 1100 horsepower; triple reduction units, ratios from 79 up to 360 to 1, capacities up to 420 horsepower.

WORM-HELICAL GEAR DRIVES

Heavy duty vertical drives with horizontal input shafts and vertical output shafts—up or down. Ratios from approximately 25 to 285 to 1 and a capacity range up to 128 horsepower.

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- ☐ Bulletin LPB Line-O-Power Straight Line Drives
- ☐ Bulletin MPB Maxi-Power Helical Gear Drives
- ☐ Bulletin GMA Foote Bros.-Louis Allis Gearmotors
- ☐ Bulletin WHA Worm-Helical Gear Drives

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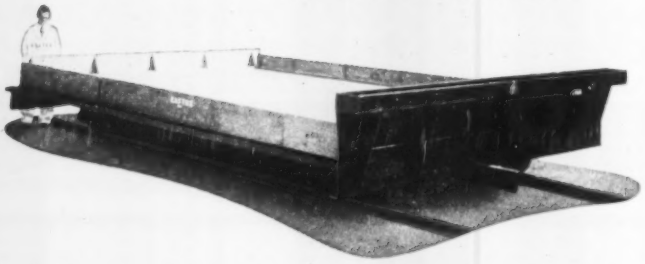

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eration involving large numbers of cutting and grinding tools served by a central coolant system, and may be used for clarification of mineral oil or soluble oil coolants. It eliminates need for individual coolant pumps and motors on machine tools and labor required to clean individual sumps and lines. Design provides for flow rates up to 1000 gallons per minute.

Check No. 14 on Reply Card for more Details

Isoma Toolmaker Microscope

Cosa Corp., 405 Lexington Ave., New York 17, N. Y., is introducing in the United States the Isoma toolmaker's microscope designed for measuring watch and instrument parts, extremely small screw machine parts and similar precision items. These microscopes have interchangeable objectives for 20X, 30X, 50X, or 100X magnification; a 360-degree angle measuring device fully graduated and numbered every 10 minutes; adjustable illumination for top and underneath lighting of workpiece; and micrometer spindles calibrated in 0.005 and 0.00005-inch. Two models, designated M-101 and M-102, are available. Object table of the model M-101 is 3¼ inches square while crosswise and lengthwise travel of micrometer spindles is 11/16-inch. Object table of model M-102 is 3-7/16 x 3⅜ inch; spindle travel lengthwise is 1¼ inch, crosswise 1-3/16 inch.

Check No. 15 on Reply Card for more Details

Copier Features Speed, Width

Printing width of 46 inches and exposure speed up to 95 inches per minute are possible on a copying machine, model 20, being marketed by Charles Bruning Co. Inc., 100 Reade St., New York, N. Y. The machine is connected to a 60 cycle, 115 volt ac line. Fifty and 25 cycle machines also are available. Copies may be made on sensitized paper, acetates, films and cloths and are handled safely and conveniently under ordinary office or factory illumination.

Check No. 16 on Reply Card for more Details

Rotary Straightening Machine

Two rotary straightening machines, built to work pipe sizes ranging from 1.900 to 16 inches in diameter, are made by Sutton Engineering Co., Bellefonte, Pa. Larger straightener is a 5 M KTC, 7-roll unit equipped with power operated screw downs and automatic angle device for all straightening rolls. Machine will operate at a straightening speed of 50 to 200 feet per minute, using 200 hp adjustable speed dc motor. It straightens pipe having 4½ to 16-inch OD. The smaller machine is

the B type 5-roll unit powered with a 75 hp variable speed motor and operates at production speeds of 60 to 240 feet per minute. Pipe sizes accommodated range from 1.900 to 6.625-inch OD.

Check No. 17 on Reply Card for more Details

Magnetic Driving Assembly

A new magnetic driving assembly with replaceable sockets for use on power wrenches for self-tapping and sheet metal screws is introduced by Magna Tool Corp., Buffalo 3, N. Y. By embedding an Alnico magnet in the driving member instead of the socket, it is easy to replace the socket without damaging or destroying the Alnico material. Tool's magnetic tip retracts under pressure so that driving pressure is applied against a shoulder in the socket instead of the tip.

Check No. 18 on Reply Card for more Details

Air Pressurized Fire Extinguisher

A one-quart Alfco air pressurized fire extinguisher that discharges vaporizing liquid fluid for extinguishing both flammable liquid and electric type fires, is announced by American-LaFrance-Foamite Corp., Elmira, N. Y. It operates with trigger action and requires no pumping.

Check No. 19 on Reply Card for more Details

Rust Preventive Wrapper

A heavy duty packaging paper treated with a volatile type rust inhibitor is announced by Nox-Rust Chemical Corp., Chicago. Called Vapor Wrapper, it is tough, resilient and tear-resistant. It is made of two high strength kraft sheets, cemented together and reinforced with spun glass fibers.

Check No. 20 on Reply Card for more Details

Lightweight Spray Gun

Model 29 spray gun, made by Binks Mfg. Co., Chicago 12, Ill., can be used to spray lacquers, synthetic enamels, paints and all other finishes and coatings of light or medium viscosity. The gun body is an aluminum casting. A brass and steel material passage protects the casting from corrosion and erosion. Cartridge-type air valve and its seat are replaceable as a complete unit.

Check No. 21 on Reply Card for more Details

Flexible Metallic Tubing

Flexible metallic tubing, developed by Vermont Flexible Tubing Co., Lyndonville, Vt., is designated as Sealflex. It is designed to provide a feed line for oil, coolants or solvents without leakage, to withstand stress and

BETTER LONGER!

RUN-OUT TABLE
ACTUAL SERVICE RECORDS
OF THREE YEARS
WITHOUT
MAINTENANCE

★ On run-out tables, as well as on other equipment, Lovejoy Flexible Couplings are giving outstanding performance. They feature free-floating load cushions suspended between heavy metal jaws. Cushions will last two to five years *and there is no shut-down for changing.* These couplings instantly counteract mis-alignment, vibration, backlash and surge. To eliminate costly break-downs and shut-downs due to coupling failure on run-out tables and other equipment, use Lovejoy Flexible Couplings. No lubrication ever required.

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WHAT'S THE BEST WAY TO STRIP PAINT FROM METAL PARTS TOO LARGE TO BE SOAKED IN TANKS?
See Page 3

Oakite's New FREE Booklet on Paint Stripping

answers many questions that will lead you to better stripping procedures. You'll want to read more about:

What's the best way to strip large areas of structural metal where a steam supply is available? *See page 5.*

What is the best method when steam is not available? *See page 7.*

What is the cheapest way to strip metal parts in large volume? *See page 9.*

What are the best ways to prepare stripped surfaces for repainting? *See page 11.*

What strippers are best for removing oil-base paints? . . . Synthetic enamels, alkali-resistant plastics or resin-based paints? . . . Japans, wrinkle finishes, nitrocellulose lacquers, alkyds, phenolics and ureas? *See page 12.*

FREE For a copy of "How to STRIP PAINT" write to Oakite Products, Inc., 34E Thames St., New York 6, N. Y.

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strain, change in volume of flow and machine vibration. It will bend to any position; the more you bend it, the tighter the seal. Tubing is available in five sizes and can be provided with male or female couplings, nozzles, stop cocks and unions or fitted to customer's specifications.

Check No. 22 on Reply Card for more Details

Conveyor Has Three Units

A new type of conveyor with three units—straight sections, 90 degree curved sections and adjustable trestles—is available from Lyon Metal Products Inc., Aurora, Ill. Balanced rollers rotate on full length cold rolled steel shafts fitted with ball bearings. Shafts retain alignment and cross channels prevent frame from spreading under heavy loads.

Check No. 23 on Reply Card for more Details

Lead-Free Aluminum Solder Rod

No. 37 aluminum solder rod, developed by All-State Welding Alloys Co. Inc., White Plains, N. Y., is lead free, melting at 400° F and flowing at 450° F. It can be applied with ordinary soldering irons as well as by any indirect heating method. It is used with the company's No. 37 Brazaloy flux.

Check No. 24 on Reply Card for more Details

Pneumatic Check Valve

Bobrick Mfg. Co., Los Angeles 39, Calif., offers a pneumatic check valve for operation at air pressures up to 4000 psi and hydraulic pressures up to 5000 psi. Maximum free flow is 7.0 pounds per minute. Maximum pressure drop through valve is 100 psig at 7.0 pounds per minute air flow with an air inlet pressure of 150 psig maximum.

Check No. 25 on Reply Card for more Details

Phenolic Foam Core Material

Corform, a liquid phenolic resin, when mixed cold will form to a hard consisteney without applied heat at room temperature, is introduced by Rezolin Inc., Los Angeles 16, Calif. It is of honeycomb appearance with tiny globular nonconnecting cells and has a density of approximately 14 pounds per cubic foot. Compressive strength is 500 psi.

Check No. 26 on Reply Card for more Details

Keg Pallet and Cover

To simplify transportation and storage of hard-to-handle kegs, Phillips Mine & Mill Supply Co., Pittsburgh, Pa., introduces model KP-6 unit that consists of a steel keg pallet and a steel cover for protecting kegs and contents. Designed for handling with a fork lift truck, the pallet will accommodate six standard kegs. Deck is slightly recessed to prevent kegs from rolling off.

Check No. 27 on Reply Card for more Details

Drill Jig Eliminates Layout

An adjustable drill jig, announced by Mathewson Machine Works Inc., North Quincy 71, Mass., eliminates layout and cuts drilling time on small lots. It is used for drilling holes through round stock and hex stock from ¼ to 2 inches and for cap screws from ¼ to 1¼ inches.

Check No. 28 on Reply Card for more Details

All Purpose Floor Machine

An improved line of all-purpose floor machines is announced by Multi-Clean Products Inc., St. Paul 1, Minn. The disk-type floor machines are available in 12, 14, 16 and 19-inch sizes for all types of floor maintenance operations. Units feature an adjustable handle that may be regulated to operator's height.

Check No. 29 on Reply Card for more Details

Quick Acting Clamp

Quick-Lok clamp, made by O'Neil-Irwin Mfg. Co., Lake City, Minn., is available for all No. 2 and No. 3 Di-Acro benders now in use. It is mounted by bolting it onto the bender base. It is recommended for use when bending tubing, angle, channel and extrusions as it locks these materials during the forming operation and its wide opening jaws allow easy removal of the formed part.

Check No. 30 on Reply Card for more Details

Temperature Regulators

An expansion stem type regulator used to maintain liquids or air at any temperature desired by controlling pneumatic or water operated diaphragm valves or dampers is offered by Powers Regulator Co., Skokie, Ill. Known as Accritem regulator, it is mounted with the thermostatic bulb at the point where the desired temperature is to be maintained.

Check No. 31 on Reply Card for more Details

FOR MORE INFORMATION on the new products and equipment in this section, fill in a card. It will receive prompt attention.

Helpful Literature

73. Protective Hats

Mine Safety Appliances Co.—To stimulate wearing of protective hats, 8-page pocket size booklet No. 992641 points out importance of adequate head protection by citing eight examples where workers have been protected wearing Skullguard hats. Care and design features of hat are discussed.

74. Well Water Systems

Layne & Bowler, Inc.—48-page illustrated catalog WS-50 presents information on well water systems for gravel wall, tubular, rock and cement wells; special drilling; shutter screens; vertical turbine pumps; and water treatment and conditioning. Various useful engineering tables are included.

75. Furnace Construction

Laclede Arch Co.—32-page illustrated catalog No. 4 shows suspended arches and sectionally supported walls as applied to all types of furnace enclosures, including open hearths; mill, forge and annealing furnaces; and others. Use is made of Duo-Seal tile offered in any grade of refractory.

76. Grinding Machines

Mattison Machine Works—20-page illustrated catalog 1901RM tabulates complete specifications and outlines features of line of over 50 grinding machines. Types covered include vertical spindle, rotary type, rotary automatic, reciprocating, horizontal and vertical surface grinders; traveling table and traveling wheel face grinders; and single, double and vertical spindle and automatic single wheel disk grinders.

77. Nickel Alloy Pipe

International Nickel Co.—Fabrication and design of nickel and high nickel alloy pipe and tubing is subject of illustrated technical booklet T-17. Its 28 pages contain drawings and tables on mechanical and physical properties, ASME code requirements, recommended welding procedures and other information.

78. Precision Screws

R. Y. Ferner Co.—Illustrated catalog contains data on precision screws and supplies for scientific instrumentation. Precision milled thread screws, instrument screws in brass or steel, washers, hexagon nuts, wood screws in brass and steel, Invar screws and gear rack and pinion rod stock are included.

79. Tapping Equipment

Hamilton Tool Co.—4-page illustrated bulletin T-47 "Hamilton Equipment for Production Tapping of Small Holes" outlines features, capacities, speeds, clearances, travel and mechanical and electrical characteristics of Super Sensitive tapping machines.

80. Diaphragm Motor Valves

Minneapolis-Honeywell Regulator Co., Brown Instruments Div.—4-page illustrated specification sheet No. 415-1 covers series 362 air-operated diaphragm motor valves for use with narrow throttling bank or on-off instruments.

81. Induction Motors

Allis-Chalmers Mfg. Co.—Built for large range of applications from central station auxiliary to general industrial drives, large end-shield bearing squirrel-cage induction motors are described in 6-page illustrated bulletin 05B7542A. Design features of motors for speeds up to 1500 rpm are shown.

82. Comparator Gages

Moore Products Co.—24-page illustrated bulletin 8004 describes applications and specifications of type C and R pneumatic comparator gages, and gives data on pneumatic comparators for special applications. Sections are devoted to basic operating principle of gages and quality control at the machine.

83. Heavy-Duty Fork Trucks

Baker-Raulang Co., Baker Industrial Truck Div.—Complete engineering and operating information on the new 7000, 8000 and 10,000-lb capacity JOM model heavy duty fork trucks are offered in 6-page illustrated specification bulletin No. 1328. Designed for continuous duty, these industrial materials handling machines have telescoping lifts of 119, 109 and 109 in., respectively.

84. Industrial Furnaces

Sargeant & Wilbur, Inc.—4-page illustrated folder describes CM series of industrial furnaces for bright annealing, hardening and brazing of stainless steel. Use brings about savings in material, labor and floor space.

85. Refractory Metals

Fansteel Metallurgical Corp.—Engineering, research and production as applied to refractory metals such as tantalum, tungsten and molybdenum are covered in this 24-page illustrated brochure. Electrical contacts and selenium rectifiers also are included.

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86. Metal Extrusions

R. D. Werner Co.—General specifications of line of aluminum extrusions, rolled formed shapes and Chromtrim metal moldings and company facilities for producing these products are presented in 4-page illustrated folder la-WER.

87. Hose Fittings

C. B. Hunt & Son, Inc.—Valve and hose couplings, nipples and clamps are detailed in 4-page illustrated bulletin No. 104-C. These Quick-As-Wink fittings are air and water tight, swivel freely and afford control of air. Sizes range up to 4 in.

88. Grab Buckets

McKiernan-Terry Corp.—6-page illustrated bulletin C-1 contains general and application information on type C coal, ore, lightweight coal and clean-up grabs. Models open in same direction and transverse to direction of trolley travel.

89. Flexible Tubing

Vermont Flexible Tubing Co.—Single data sheet gives brief description, illustration and specifications pertinent to Sealflex metallic tubing which bends and stays put in any position.

90. Tension Indicator

General Electric Co. — Providing means for continuous tension indication of cold-rolled strip in steel, brass and aluminum mills, the G-E tensiometer is described in 8-page illustrated bulletin GEA-5512. Mechanical and electrical operation, possible applications and recommended auxiliary equipment are covered.

91. Welding Bench Heads

Federal Tool Engineering Co.—8-page bulletin No. 253 is descriptive of Tweezer Weld line of bench heads for small parts welding. Featured are heads of great diversity, single and double pair electrodes, two simultaneous weld type plus those with automatic wire feed and cut off arrangements.

92. Electroplating

Hanson-Van Winkle-Munning Co.—Four booklets and bulletins issued for the electroplating industry covering iron, zinc, chromium and graphic arts plating are: "The Electrodeposition of Iron," "Technical Instruction on S-B Process for Zinc Plating," "Engineering for Electroplating in the Graphic Arts" and "H-VW-M Chrom-Flo Anode Bulletin CFA-100."

93. Air Pollution Meter

Leeds & Northrup Co.—Application of electronic Speedomax recorder to Autometer instrument for measuring pollution of air by sulphur dioxide is illustrated and described in 8-page folder ND46-91(1). Continuous measurement in range of 0 to 5 parts per million is provided.

94. Heating & Cooling Coils

Kold-Hold Mfg. Co.—6-page illustrated bulletin IP-251 describes Platecoil equipment for faster heating or cooling of tanks. Platecoil is compact and light in weight, has high safety factor, is easy to clean and has rigid design. It can be applied to a variety of heating or cooling uses.

95. Wire Cloth Strainers

Michigan Wire Cloth Co.—"Engineer's Manual of Wire Cloth Strainer Design" presents step-by-step course in design of wire cloth strainers. Sections cover selection of grade of wire cloth, size, shape and construction of the strainer and finally, manual outlines variety of company services available.

96. Tool & Diemaker Supplies

Precision Supply & Machine Co.—8-page illustrated catalog No. 3 covers industrial supplies for tool, die and moldmaker, plus other craftsman's tools. Included are brushes, felt wheels and cones, felt bobs, lapping dust, mounted wheels and points, indicator contact points and files.

97. Solenoid Oil Valves

Hauck Mfg. Co.—Details of solenoid valves for dependable shut-off on oil pressures up to 300 psi and temperatures to 250° F are presented in 2-page catalog sheet No. 710. These UL and FM approved controls can be used on lines handling light, medium or heavy fuel oils.

98. Mercury Switches

Minneapolis-Honeywell Regulator Co., Micro Switch Div.—Condensed catalog Hg-1 covers five most popular designs of Honeywell mercury switches, with selection and application aids and complete electrical ratings and data.

99. Metal Strapping

Allegheny Steel Band Co.—Steelband strapping, seals, tensioners, sealers and accessories are illustrated and described in 6-page folder. Products are used for banding all types of packages, bales, boxes, bundles and pallets.

100. Gas Analysis

Fisher Scientific Co.—Fourth revision of "Fisher Gas-Analysis Manual" offers up-to-date description of the theory and practical application of gas analysis. Details regarding procedures in various analyses and instructions on maintaining and operating analysis equipment are included.

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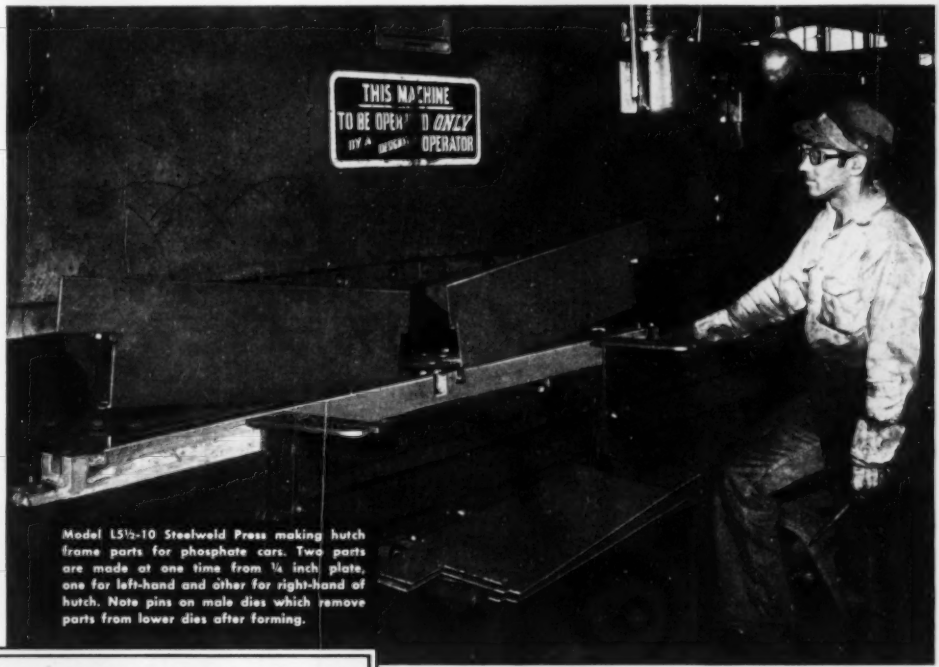

Model L5½-10 Steelweld Press making hutch frame parts for phosphate cars. Two parts are made at one time from ¼ inch plate, one for left-hand and other for right-hand of hutch. Note pins on male dies which remove parts from lower dies after forming.

A few of the many parts produced within a short period on the Steelweld Press. Curves and bends of every shape and degree are formed quickly and accurately.

"The more we use our Steelweld Bending Press, the more we learn about what it can do for us", said the Day Superintendent of Pullman-Standard Car Mfg. Co., Butler, Penna. "As a result it is handling more and more of our work. We are doing a great many forming jobs on it that did not occur to us as being possible when we first installed the machine."

An endless variety of parts are produced on this press. These are mostly of ¼ and ⅜ inch steel plate and involve curves and bends of every description for gussets, fulcrums, braces, frames, housings, etc. used in the manufacture of railroad cars.

The dies used are relatively simple and made in the company's shop. Because dies are easily changed, it usually takes about an hour to set up for a new job.

If you work with metal plate in any thickness up to one inch, for bending, forming or punching, you should get the facts on the many features of Steelweld Presses.

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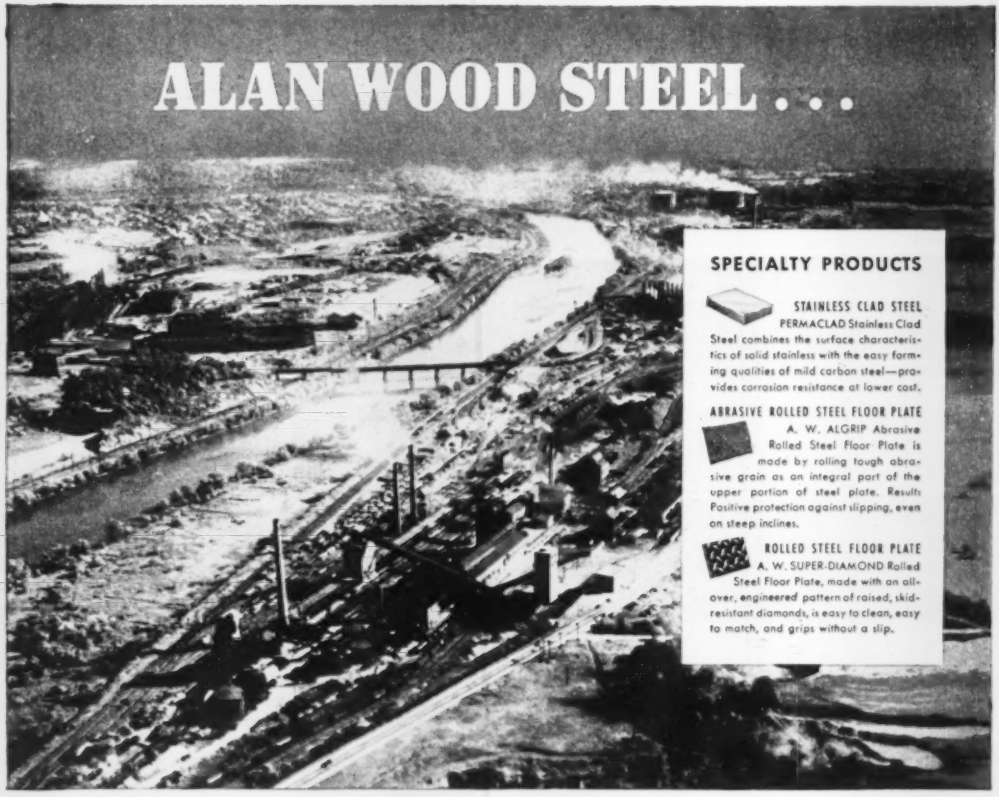

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The Market Outlook

ENTERTAINING the largest volume demand in history, the steel industry is pushing production to the limit of available facilities. Last week the national ingot operating rate went up 1 point to 101 per cent of capacity. This is the highest level since mid-August, and is the identical rate in effect just a year ago when production capacity was substantially smaller. But the steelmakers are worried for the future. How long can this current fast production pace be maintained in the face of increasingly acute scrap shortage? To date, through allocation of scrap to distress production points, serious curtailments have been averted. But the winter months are just ahead, and unless large stocks can be accumulated before severe weather sets in, operations cutbacks are believed inevitable.

CARRYOVER— Most of the steel mills will enter fourth quarter with substantial arrearages. And unless cancellations, resulting from allocations amounting to less than original specifications, involve much heavier tonnage than has resulted to date, large tonnage carryover into first quarter of next year is indicated. Meanwhile, the over-booked condition of the mills will make it difficult for consumers who have until Sept. 25 to convert unrated tonnage to Controlled Materials Plan tickets, to get positions in fourth quarter rolling schedules. As a matter of fact, the lead time has expired for the first two months of the quarter, leaving only December, for which month the mills already are booked to the hilt.

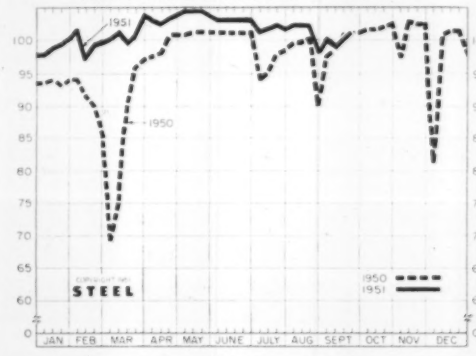
BOOKINGS— Most steelmakers have opened their orders books for first quarter 1952 tonnage on the various products. Several are booking even further ahead, though in most cases far forward commitments are restricted to military tonnage. Recent amendment to the steel control regulations permits consumers to specify 40 per cent of a quarterly allotment in any one month instead of the 35 per cent originally stipulated. However, this increase cannot become generally effective until after the turn of the year because of the tight fourth quarter situation. At the same time, producers say the recent dropping of the D classification from the A to E series of top priorities will not mean much tonnagewise.

PRODUCTS— Carbon bars are becoming one of the most difficult items to obtain, being almost in the same class with plates and shapes in this respect. Some producers are taking nothing but top priority orders for first quarter. Meanwhile, platemakers say there is little chance of new orders being accepted for rolling in the first two months of fourth quarter except in cases of concellations, which to date have been negligible. Sheetmakers are booked up solidly through fourth quarter and some CMP tickets still are being returned to consumers as expected cancellations of duplicate tonnage have not materialized in sufficient volume to free any appreciable amount of sheets for unprotected consumers. In structurals, the severe shortage of shapes threatens to force substantial curtailment in fabricating operations before yearend.

PRICES— Steel and related product prices are holding firmly. Except for a few isolated revisions, such as recent upward adjustments on plates and shapes by two eastern producers, the steel market has been devoid of significant price changes since the government freeze went into effect last January. However, speculation is rising in the trade as to what extent steel prices will be affected in event another wage increase is granted the steelworkers. With the steel wage contract coming up for renewal around yearend, this is a matter for increasing consideration in appraising the outlook for steel prices.

COMPOSITES— STEEL's weighted index on finished steel holds unchanged at 171.92 and compares with 156.99 a year ago. The arithmetical price composite on finished steel also is steady at $106.32 against $94.50 last year at this time. Pig iron composites are holding with No. 2 foundry, $52.54, basic, $52.16, and malleable, $53.27.

NATIONAL STEELWORKS OPERATIONS



DISTRICT INGOT RATES

Percentage of Capacity Engaged at Leading Production Points

	Week Ended Sept. 22	Change	Same Week 1950	Same Week 1949
Pittsburgh	99.5	+ 1*	102	84
Chicago	105	0*	103	94.5
Mid-Atlantic	100	+ 2	99	80
Youngstown	105	— 1	105	94
Wheeling	97	+ 2	98	99.5
Cleveland	99	2*	100	100.5
Buffalo	104	0	104	79.5
Birmingham	90	10	100	100
New England	82	8	93	68
Cincinnati	100		103	96
St. Louis	93	+ 0.5	88	80
Detroit	106	+ 3	102	104
Western	103	+ 4	103	80
Estimated national rate	101	+ 1	101	86

Based on weekly steelmaking capacity of 1,999,034 tons for 1951; 1,928,721 tons for second half, 1950; 1,906,268 tons for first half, 1950; 1,843,516 tons for 1949.

*Change from revised rate for preceding week.

The Metalworking Outlook—p. 57 Production Engineering News—p. 93

Composite Market Averages

	Sept. 20 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
FINISHED STEEL INDEX, Weighted:					
Index (1935-39 av.=100)	171.92	171.92	171.92	156.99	112.04
Index in cents per lb.	4.657	4.657	4.657	4.253	3.035
ARITHMETICAL PRICE COMPOSITES:					
Finished Steel, NT	$106.32	$106.32	$106.32	$94.50	$64.45
No. 2 Fdry. Pig Iron, GT	52.54	52.54	52.54	47.41	28.17
Basic Pig Iron, GT	52.16	52.16	52.16	46.61	27.50
Malleable Pig Iron, GT	53.27	53.27	53.27	48.13	28.79
Steelmaking scrap, GT	44.00	44.00	44.00	40.58	19.17

Weighted finished steel index based on average shipments and Pittsburgh district prices of the following 14 representative products during 5-year base period 1935-39: Structural shapes, plates, rails, hot-rolled and cold-finished bars, pipe, wire, nails, tin plate, hot and cold-rolled sheets, galvanized sheets, hot and cold-rolled strip. For complete explanation see STEEL, Sept. 19, 1949, p. 54.

Arithmetical steel price composite based on same products as the weighted finished steel index with the exception of rails, cold-finished bars, galvanized sheets and hot-rolled strip.

Basic and No. 2 foundry pig iron composites are based on average prices at Pittsburgh, Bethlehem, Birmingham, Buffalo, Chicago, Cleveland, Granite City, Youngstown. Malleable composite based on same points except Birmingham.

Steelmaking scrap composite based on average prices of No. 1 heavy melting steel at Pittsburgh, Chicago and Philadelphia.

Comparison of Prices

Comparative prices by districts, in cents per pound except as otherwise noted. Delivered prices based on nearest production point.

FINISHED MATERIALS

	Sept. 20 1951	Week Ago	Month Ago	Year Ago	5 Yrs. Ago
Bars, H.R., Pittsburgh	3.70	3.70	3.70	3.45	2.50
Bars, H.R., Chicago	3.70	3.70	3.70	3.45	2.50
Bars, H.R., del. Philadelphia	4.223	4.223	4.20	3.93	2.86
Bars, C.F., Pittsburgh	4.55	4.55	4.55	4.10-15	3.10
Shapes, Std., Pittsburgh	3.65	3.65	3.65	3.40	2.35
Shapes, Std., Chicago	3.65	3.65	3.65	3.40	2.35
Shapes, del. Philadelphia	3.918	3.918	3.91	3.46	2.48
Plates, Pittsburgh	3.70	3.70	3.70	3.50	2.50
Plates, Chicago	3.70	3.70	3.70	3.50	2.50
Plates, Coatesville, Pa.	4.15	4.15	4.15	3.90	2.50
Plates, Sparrows Point, Md.	3.70	3.70	3.70	3.50	2.50
Plates, Claymont, Del.	4.15	4.15	4.15	3.90	2.50
Sheets, H.R., Pittsburgh	3.60-75	3.60-75	3.60-75	3.35	2.425
Sheets, H.R., Chicago	3.60	3.60	3.60	3.35	2.425
Sheets, C.R., Pittsburgh	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Chicago	4.35	4.35	4.35	4.10	3.275
Sheets, C.R., Detroit	4.55	4.55	4.55	4.30	3.375
Sheets, Galv., Pittsburgh	4.80	4.80	4.80	4.40	4.05
Strip, H.R., Pittsburgh	3.75-4.00	3.75-4.00	3.75-4.00	3.50	2.35
Strip, H.R., Chicago	3.50	3.50	3.50	3.25	2.35
Strip, C.R., Pittsburgh	4.65-5.35	4.65-5.35	4.65-5.35	4.15-50	3.05
Strip, C.R., Chicago	4.90	4.90	4.90	4.30	3.15
Strip, C.R., Detroit	4.85-5.60	4.85-5.60	4.85-5.60	4.35-95	3.15
Wire, Basic, Pittsburgh	4.85-5.10	4.85-5.10	4.85-5.10	4.50	3.05
Nails, Wire, Pittsburgh	5.90-6.20	5.90-6.20	5.90-6.20	5.30	3.75
Tin plate, box, Pittsburgh	$8.70	$8.70	$8.70	$7.50	$5.25

SEMIFINISHED

Billets, forging, Pitts. (NT)	$66.00	$66.00	$66.00	$63.00	$47.00
Wire rods, $\frac{7}{32}$-$\frac{9}{32}$", Pitts.	4.10-30	4.10-30	4.10-30	3.85	2.30

PIG IRON, Gross Ton

Bessemer, Pitts.	$53.00	$53.00	$53.00	$47-$50	$29.00
Basic, Valley	52.00	52.00	52.00	46-49	28.00
Basic, del. Phila.	56.61	56.61	56.49	50.39	29.93
No. 2 Fdry., Pitts.	52.50	52.50	52.50	48.50	28.50
No. 2 Fdry., Chicago	52.50	52.50	52.50	46.50	28.50
No. 2 Fdry., Valley	52.50	52.50	52.50	48.50-49.50	28.50
No. 2 Fdry., Del. Phila.	57.11	57.11	56.99	50.89	30.43
No. 2 Fdry., Birm.	48.88	48.88	48.88	42.38	24.88
No. 2 Fdry (Birm.) del. Cin.	55.49	55.49	55.33	49.08	28.94
Malleable, Valley	52.50	52.50	52.50	46.50-49.50	28.50
Malleable, Chicago	52.50	52.50	52.50	46.50	28.50
Charcoal, Lyles, Tenn.	66.00	66.00	66.00	60.00	33.00
Ferromanganese, Etna, Pa.	188.00	188.00	188.00	175.00	140.00*

* Delivered, Pittsburgh.

SCRAP, Gross Ton (including broker's commission)

No. 1 Heavy Melt, Pitts.	$45.00	$45.00	$45.00	$44.00	$20.00
No. 1 Heavy Melt, E. Pa.	43.50	43.50	43.50	37.75	18.75
No. 1 Heavy Melt, Chicago	43.50	43.50	43.50	40.00	18.75
No. 1 Heavy Melt, Valley	45.00	45.00	45.00	43.75	20.00
No. 1 Heavy Melt, Cleve.	44.00	44.00	44.00	43.25	19.50
No. 1 Heavy Melt, Buffalo	44.00	44.00	44.00	41.50	19.25
Rails, Rerolling, Chicago	52.50	52.50	52.50	59.50	22.25
No. 1 Cast, Chicago	49.00*	49.00*	49.00*	50.50	20.00

* F.o.b. shipping point.

COKE, Net Ton

Beehive, Furn. Connlsvl.	$14.75	$14.75	$14.75	$14.25	$8.75
Beehive, Fdry., Connlsvl.	17.50	17.50	17.50	16.00	9.50
Oven, Fdry., Chicago	23.00	23.00	23.00	21.00	14.35

NONFERROUS METALS

Copper, del. Conn.	24.50	24.50	24.50	22.50-24.50	14.375
Zinc, E. St. Louis	17.50	17.50	17.50	17.50	8.25
Lead, St. Louis	16.80	16.80	16.80	15.80	8.10
Tin, New York	103.00	103.00	103.00	102.50	52.00
Aluminum, del.	19.00	19.00	19.00	17.50	15.00
Antimony, Laredo, Tex.	42.00	42.00	42.00	32.00	14.50
Nickel, refinery, duty paid	56.50	56.50	56.50	48.00	35.00

PIG IRON

F.o.b. furnace prices quoted under GCPR as reported to STEEL. Minimum delivered prices are approximate and do not include 3% federal tax. Key to producing companies published on second following page.

PIG IRON, Gross Ton

	Basic	No. 2 Foundry	Malleable	Bessemer
Bethlehem, Pa. B2	$54.00	$54.50	$55.00	$55.50
Brooklyn, N.Y., del.	....	59.18	59.68	....
Newark, del.	56.87	57.37	57.87	58.37
Philadelphia, del.	56.61	57.11	57.61	58.11
Birmingham District				
Alabama City, Ala. R2	48.38	48.88	....	....
Birmingham, R2	48.38	48.88	....	....
Birmingham S9	48.38	48.88	....	....
Woodward, Ala. W15	48.38	48.88	....	....
Cincinnati, del.	....	55.49	....	....
Buffalo District				
Buffalo R2	52.00	52.50	53.00	....
Buffalo H1	52.00	52.50	53.00	....
Tonawanda, N.Y. W12	52.00	52.50	53.00	....
No Tonawanda, N.Y. T9	....	52.50	53.00	....
Boston, del.	62.11	62.61	63.11	....
Rochester, N.Y., del.	54.88†	55.38†	55.88†	....
Syracuse, N.Y., del.	55.91†	56.41†	56.91†	....
Chicago District				
Chicago I-3	52.00	52.50	52.50	53.00
Gary, Ind. U5	52.00	....	52.50	....
Indiana Harbor, Ind. I-2	52.00	....	52.50	....
So. Chicago, Ill. W14	52.00	52.50	52.50	....
So. Chicago, Ill. Y1	52.00	52.50	52.50	....
So. Chicago, Ill. U3	52.00	....	52.50	53.00
Milwaukee, del.	54.06	54.56	54.56	55.06
Muskegon, Mich., del.	....	58.47	58.47	....
Cleveland District				
Cleveland A7	52.00	52.50	52.50	53.00
Cleveland R2	52.00	52.50	52.50	....
Akron, O., del. from Cleve.	54.61	55.11	55.11	55.61
Lorain, O. N3	52.00	....	....	53.00
Duluth I-3	....	....	52.50	....
Erie, Pa. I-3	52.00	52.50	52.50	53.00
Everett, Mass. E1	....	55.25	55.75	....
Fontana, Calif. K1	58.00	58.50	....	....
Geneva, Utah G1	52.00	52.50	....	....
Seattle, Tacoma, Wash., del.	....	60.66	....	....
Portland, Oreg., del.	....	60.66	....	....
Los Angeles, San Francisco, del.	60.16	60.66	....	....
Granite City, Ill. G4	53.90	54.40	54.90	....
St. Louis, del. (inc. tax)	54.66	55.16	55.66	....
Ironton, Utah C11	52.00	52.50	....	....
Lone Star, Tex. L6	48.00	*48.50	48.50	....
Minnequa, Colo. C10	54.00	55.00	55.00	....
Pittsburgh District				
Neville Island, Pa. P6	....	52.50	52.50	53.00
Pitts., N &S. sides, Ambridge, Aliquippa, del.	....	53.80	53.80	54.30
McKeesRocks, del.	....	53.54	53.54	54.04
Lawrenceville, Homestead, McKeesport, Monaca, del.	....	54.07	54.07	54.57
Verona, del.	....	54.57	54.57	55.07
Brackenridge, del.	....	54.82	54.82	55.32
Bessemer Pa. U5	52.00	....	52.50	53.00
Clairton, Rankin, So. Duquesne, Pa. U5	52.00	....	....	....
McKeesport, Pa. N3	52.00	....	....	53.00
Monessen, Pa. P7	54.00	....	....	....
Sharpsville, Pa. S6	....	....	52.50	53.00
Steelton, Pa. B2	54.00	54.50	55.00	55.50
Swedeland, Pa. A3	56.00	56.50	57.00	57.50
Toledo, O. I-3	52.00	52.50	52.50	53.00
Cincinnati, del.	57.47	57.97	....	....
Troy, N.Y. R2	54.00	54.50	55.00	55.50
Youngstown District				
Hubbard, O. Y1	52.00	52.50	52.50	....
Youngstown Y1	52.00	52.50	52.50	....
Youngstown U5	52.00	....	....	53.00
Mansfield, O., del.	56.65	57.15	57.15	57.65

* Low phos, southern grade. † Preliminary.

PIG IRON DIFFERENTIALS

Silicon: Add 50 cents per ton for each 0.25% Si over base grade, 1.75-2.25%, except on low phos iron on which base is 1.75-2.00%.

Phosphorus: Deduct 38 cents per ton for P content of 0.70% and over.

Manganese: Add 50 cents per ton for each 0.50% manganese over 1% or portion thereof.

Nickel: Under 0.50% no extra; 0.50-0.74%, incl., add $2 per ton and each additional 0.25%, add $1 per ton.

BLAST FURNACE SILVERY IRON, Gross Ton

(Base 6.00-6.50% silicon; add $1.50 for each 0.5% Si)

Jackson, O. G2, J1	$62.50
Buffalo H1	63.75

ELECTRIC FURNACE SILVERY PIG IRON, Gross Ton

(Base 14.01-14.50% silicon; add $1 for each 0.5% Si to 18%; $1 for each 0.5% Mn over 1%; $1 for each 0.045% max. P)

Niagara Falls, N.Y. P15	$88.00
Keokuk, Iowa, Openhearth & Fdry. frt. allowed K2	92.50
Keokuk, OH & Fdry., 12¼ lb piglets, 16% Si, frt. allowed K2	95.50
Wenatchee, Wash., O.H. & Fdry., frt. allowed K2	92.50

CHARCOAL PIG IRON, Gross Ton

(Low phos semi-cold blast; differential charged for silicon over base grade; also for hard chilling iron Nos. 5 & 6)

Lyles, Tenn. T3	$66.00

LOW PHOSPHORUS PIG IRON, Gross Ton

Cleveland, intermediate, A7	$57.00
Steelton, Pa. B2	60.00
Philadelphia, delivered	63.37
Troy, N.Y. R2	60.00

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Semifinished and Finished Steel Products

Mill prices quoted under GCPR as reported to STEEL, Sept. 20, 1951; cents per pound except as otherwise noted. Changes shown in italics. Code numbers following mill points indicate producing company; key on next two pages.

INGOTS, Carbon, Forging (NT)
Fontana,Calif. K1 ....$79.00
Munhall,Pa. U5 .....52.00

INGOTS, Alloy (NT)
Detroit R7 .....$54.00
Fontana,Calif. K1 ....80.00
Houston,Tex. S5 .....62.00
Midland,Pa. C18 .....54.00
Munhall,Pa. U5 .....54.00

BILLETS, BLOOMS & SLABS
Carbon, Rerolling (NT)
Bessemer,Pa. U5 ....$56.00
Clairton,Pa. U5 .....56.00
Ensley,Ala. T2 .....56.00
Fairfield,Ala. T2 .....56.00
Fontana,Calif. K1 ....75.00
Gary,Ind. U5 .....56.00
Johnstown,Pa. B2 ....56.00
Lackawanna,N.Y. B2..56.00
Munhall,Pa. U5 .....56.00
So.Chicago,Ill. U5 ....56.00
So.Duquesne,Pa. U5 ...56.00

Carbon, Forging (NT)
Bessemer,Pa. U5 ....$66.00
Buffalo R2 .....66.00
Canton,O. R2 .....66.00
Clairton,Pa. U5 .....66.00
Cleveland R2 .....66.00
Conshohocken,Pa. A3 ..73.00
Detroit R7 .....69.00
Ensley,Ala. T2 .....66.00
Fairfield,Ala. T2 .....66.00
Fontana,Calif. K1 ....85.00
Gary,Ind. U5 .....66.00
Geneva,Utah G1 .....66.00
Houston,Tex. S5 .....74.00
Johnstown,Pa. B2 ....66.00
Lackawanna,N.Y. B2 ..66.00
LosAngeles B3 .....85.00
Munhall,Pa. U5 .....66.00
Seattle B3 .....66.00
So.Chicago R2,U5,W14 ..66.00
So.Duquesne,Pa. U5 ...66.00
So.SanFrancisco B3 ...85.00

Alloy, Forging (NT)
Bethlehem,Pa. B2 ....$70.00
Buffalo R2 .....70.00
Canton,O. R2 .....70.00
Canton,O.(29) T7 .....66.00
Conshohocken,Pa. A3 ..77.00
Detroit R7 .....73.00
Fontana,Calif. K1 ....89.00
Gary,Ind. U5 .....70.00
Houston,Tex. S5 .....78.00
Ind.Harbor,Ind. Y1 ....70.00
Johnstown,Pa. B2 ....70.00
Lackawanna,N.Y. B2 ..70.00
LosAngeles B3 .....90.00
Massillon,O. R2 .....70.00
Midland,Pa. C18 .....70.00
Munhall,Pa. U5 .....70.00
So.Chicago R2,U5,W14..70.00
So.Duquesne,Pa. U5 ...70.00
Struthers,O. Y1 .....70.00
Warren,O. C17 .....70.00

ROUNDS, SEAMLESS TUBE (NT)
Canton,O. R2 .....$82.00
Cleveland R2 .....82.00
Fontana,Calif. K1 ....103.00
Gary,Ind. U5 .....82.00
Massillon,O. R2 .....82.00
So.Chicago,Ill. R2 ....82.00
So.Duquesne,Pa. U5 ...82.00

SHEET BARS (NT)
Fontana,Calif. K1 ....$89.00

SKELP
Aliquippa,Pa. J5 .....$3.45
Munhall,Pa. U5 .....3.35
Warren,O. R2 .....3.35
Youngstown, R2, U5 ....3.35

WIRE RODS
Alton,Ill. L1 .....4.40
AlabamaCity,Ala. R2 ..4.10
Buffalo W12 .....4.10
Cleveland A7 .....4.10
Donora,Pa. A7 .....4.10
Fairfield,Ala. T2 .....4.10
Fontana,Calif. K1 ....4.60
Houston,Tex. S5 .....4.50
Johnstown,Pa. B2 ....4.10
LosAngeles B3 .....4.90
Minnequa,Colo. C10 ....4.35
Monessen,Pa. P7 .....4.10
No.Tonawanda,N.Y.B11 ..4.10
Pittsburg,Calif. C11 ....4.75
Portsmouth,O. P12 .....4.30
Roebling,N.J. R5 .....4.20
So. Chicago,Ill. R2 ....4.10
SparrowsPoint,Md. B2 ..4.20
Sterling,Ill.(1) N15 ....4.10
Struthers,O. Y1 .....4.10
Torrance,Calif. C11 ....4.90
Worcester,Mass. A7 ....4.40

SHEET STEEL PILING
Ind.Harbor,Ind. I-2 ....4.45
Lackawanna,N.Y. B2 ....4.45
Munhall,Pa. U5 .....4.45
So.Chicago,Ill. U5 .....4.45

STRUCTURALS
Carbon Steel Stand. Shapes
AlabamaCity,Ala. R2 ...3.60
Aliquippa,Pa. J5 .....3.65
Bessemer,Ala. T2 .....3.65
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fairfield,Ala. T2 .....3.65
Fontana,Calif. K1 .....4.25
Gary,Ind. U5 .....3.65
Geneva,Utah G1 .....3.65
Houston,Tex. S5 .....4.65
Ind.Harbor,Ind. I-2 ....3.65
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.25
Lackawanna,N.Y. B2 ...3.70
LosAngeles B3 .....4.25
Minnequa,Colo. C10 ....4.10
Munhall,Pa. U5 .....3.65
Niles,Calif.(22) P1 .....4.85
Phoenixville,Pa. P4 .....6.25
Portland,Oreg. O4 .....4.50
Seattle B3 .....4.30
So.Chicago,Ill. U5, W14..3.65
So.SanFrancisco B3 ....4.20
Torrance,Calif. C11 ....4.25
Weirton,W.Va. W6 .....3.90

Alloy Stand. Shapes
Clairton,Pa. U5 .....4.35
Fontana,Calif. K1 .....5.55
Munhall,Pa. U5 .....4.35
So.Chicago,Ill. U5 .....4.35

H.S., L.A. Stand. Shapes
Aliquippa,Pa. J5 .....5.50
Bessemer,Ala. T2 .....5.50
Bethlehem,Pa.(14) B2..5.50
Clairton,Pa. U5 .....5.50
Fairfield,Ala. T2 .....5.50
Fontana, Calif. K1 .....6.10
Gary,Ind. U5 .....5.50
Geneva,Utah G1 .....5.50
Ind.Harbor,Ind. I-2 ....5.50
Ind.Harbor,Ind. Y1 .....6.00
Johnstown,Pa. B2 .....5.50
Lackawanna,N.Y.(14)B2 5.50
LosAngeles B3 .....6.05
Munhall,Pa. U5 .....5.50
Seattle B3 .....6.10
So.Chicago,Ill. U5 .....5.50
So.SanFrancisco B3 ....6.00
Struthers,O. Y1 .....6.00

Wide Flange
Bethlehem,Pa. B2 .....3.70
Clairton,Pa. U5 .....3.65
Fontana,Calif. K1 .....4.65
Lackawanna,N.Y. B2 ....3.70
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

H.S., L.A. Wide Flange
Bethlehem,Pa. B2 .....5.50
Lackawanna,N.Y. B2 ....5.50
Munhall,Pa. U5 .....5.45
So.Chicago,Ill. U5 .....5.45

BEARING PILES
Munhall,Pa. U5 .....3.65
So.Chicago,Ill. U5 .....3.65

PLATES,High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.65
Bessemer,Ala., T2 .....5.65
Clairton,Pa. U5 .....5.65
Cleveland R2 .....5.65
Conshohocken,Pa. A3 ....5.90
Fairfield,Ala. T2 .....5.65
Fontana,Calif.(30) K1 ...6.25
Gary,Ind. U5 .....5.65
Geneva,Utah G1 .....5.65
Ind.Harbor,Ind. I-2 ....5.65
Ind.Harbor, Ind. Y1 .....6.15
Johnstown,Pa. B2 .....5.65
Munhall,Pa. U5 .....5.65
Pittsburgh J5 .....5.65
Seattle B3 .....6.55
Sharon,Pa. S3 .....5.70
So.Chicago,Ill. U5 .....5.65
SparrowsPoint,Md. B2 ...5.65
Warren,O. R2 .....5.65
Youngstown, Y1 .....6.15

PLATES, Open-Hearth Alloy
Claymont,Del. C22 .....4.85
Coatesville,Pa. L7 .....5.25
Conshohocken,Pa. A3 ....5.05
Fontana,Calif. K1 .....5.70
Gary,Ind. U5 .....4.75
Johnstown,Pa. B2 .....4.75
Munhall,Pa. U5 .....4.75
Sharon,Pa. S3 .....5.20
So.Chicago,Ill. U5 .....4.75
SparrowsPoint,Md. B2 ...4.75

FLOOR PLATES
Cleveland J5 .....4.75
Conshohocken,Pa. A3 ....4.75
Harrisburg,Pa. C5 .....5.95
Ind.Harbor, Ind. I-2 ....4.75
Munhall,Pa. U5 .....4.75
So.Chicago, Ill. U5 .....4.75

PLATES, Ingot Iron
Ashland,c.l.(15) A10 ....3.95
Ashland,lcl(15) A10 .....4.45
Cleveland,c.l. R2 .....4.30
Warren,O.,c.l. R2 .....4.30

PLATES, Carbon Steel
AlabamaCity,Ala. R2 ...3.70
Aliquippa,Pa. J5 .....3.70
Ashland,Ky.(15) A10 ...3.70
Bessemer,Ala. T2 .....3.70
Clairton,Pa. U5 .....3.70
Claymont,Del. C22 .....4.15
Cleveland J5, R2 .....3.70
Coatesville,Pa. L7 .....4.15
Conshohocken,Pa. A3 ....4.15
Fairfield,Ala. T2 .....3.70
Fontana,Calif.(30) K1 ...4.30
Gary,Ind. U5 .....3.70
GraniteCity,Ill. G4 .....4.40
Geneva,Utah, G1 .....3.70
Harrisburg,Pa. C5 .....6.75
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ....3.70
Minnequa,Colo. C10 .....4.50
Munhall,Pa. U5 .....3.70
Pittsburgh J5 .....3.70
Seattle B3 .....4.60
Sharon,Pa. S3 .....3.90
So.Chicago,Ill. U5, W14..3.70
SparrowsPoint,Md. B2 ...3.70
Steubenville,O. W10 ....3.70
Warren,O. R2 .....3.70
Weirton,W.Va. W6 .....4.00
Youngstown R2, U5, Y1..3.70

PLATES, Carbon A.R.
Fontana,Calif. K1 .....5.45
Geneva,Utah G1 .....4.85

PLATES, Wrought Iron
Economy,Pa. B14 .....8.60

BARS, Hot-Rolled Carbon
AlabamaCity,Ala. R2 ...3.70
Aliquippa,Pa. J5 .....3.70
Alton,Ill. L1 .....4.15
Atlanta,Ga. A11 .....4.25
Bessemer,Ala. T2 .....3.70
Buffalo R2 .....3.70
Canton,O. R2 .....3.70
Clairton,Pa. U5 .....3.70
Cleveland R2 .....3.70
Detroit R7 .....3.85
Emeryville,Calif. J7 .....4.45
Fairfield,Ala. T2 .....3.70
Fontana, Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. I-2, Y1..3.70
Johnstown,Pa. B2 .....3.70
KansasCity,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 .....4.40
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 .....4.15
Niles,Calif. P1 .....5.05
N.Tonawanda,N.Y. B11..3.70
Pittsburg,Calif. C11 .....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.Chicago R2,U5,W14 ...3.70
So.Duquesne,Pa. U5 .....3.70
So.SanFran.,Cal. B3 .....4.43
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Weirton,W.Va. W6 .....3.85
Youngstown R2, U5 .....3.70

BAR SIZE ANGLES, S. SHAPES
Aliquippa,Pa. J5 .....3.70
Atlanta A11 .....4.25
Johnstown,Pa. B2 .....3.70
Lackawanna,N.Y. B2 ....3.70
Niles,Calif. P1 .....5.05
Portland,Oreg. O4 .....4.65
SanFrancisco S7 .....4.85

BAR SIZE ANGLES,H.R. CARBON
Bethlehem,Pa. B2 .....3.90

BARS, Hot-Rolled Alloy
Bethlehem,Pa. B2 .....4.30
Buffalo R2 .....4.30
Canton,O. R2 .....4.30
Canton,O.(29) T7 .....3.95
Clairton,Pa. U5 .....4.30
Detroit R7 .....4.45
Ecorse,Mich. G5 .....4.65
Fontana,Calif. K1 .....5.35
Gary,Ind. U5 .....4.30
Houston,Tex. S5 .....4.70
Ind.Harbor,Ind. I-2, Y1..4.30
Johnstown,Pa. B2 .....4.30
KansasCity,Mo. S5 .....4.90
Lackawanna,N.Y. B2 ....4.30
LosAngeles B3 .....5.35
Massillon,O. R2 .....4.30
Midland,Pa. C18 .....4.30
So.Chicago R2,U5,W14..4.30
So.Duquesne,Pa. U5 .....4.30
Struthers,O. Y1 .....4.30
Warren,O. C17 .....4.30
Youngstown U5 .....4.30

BAR SHAPES, Hot-Rolled Alloy
Clairton,Pa. U5 .....4.55
Gary, Ind. U5 .....4.55
Youngstown U5 .....4.55

BARS & SMALL SHAPES, H. R., High-Strength Low-Alloy
Aliquippa,Pa. J5 .....5.55
Bessemer,Ala. T2 .....5.55
Bethlehem,Pa. B2 .....5.55
Clairton,Pa. U5 .....5.55
Cleveland R2 .....5.55
Fairfield,Ala. T2 .....5.55
Fontana,Calif. K1 .....6.60
Gary,Ind. U5 .....5.55
Ind.Harbor,Ind. I-2 .....5.55
IndianaHarbor,Ind. Y1 ...6.05
Johnstown,Pa. B2 .....5.55
Lackawanna,N.Y. B2 ....5.55
LosAngeles B3 .....6.25
Pittsburgh J5 .....5.55
Seattle B3 .....6.30
So.Duquesne,Pa. U5 .....5.55
So.SanFrancisco B3 ....6.30
Struthers, O. Y1 .....6.05
Youngstown U5 .....5.55

BARS, Cold-Finished Carbon
Ambridge,Pa. W18 .....4.55
BeaverFalls,Pa. M12,R2 ..4.55
Buffalo B5 .....4.60
Camden,N.J. P13 .....5.00
Carnegie,Pa. C12 .....4.55
Chicago W18 .....4.55
Cleveland A7, C20 .....4.55
Detroit P17 .....4.70
Donora,Pa. A7 .....4.65
Elyria,O. Ws 4.55
FranklinPark,Ill. N5 .....4.55
Gary,Ind. U5 .....4.55
GreenBay, Wis. F7 .....4.55
Hammond,Ind. L2, M13 ..4.55
Hartford,Conn. R2 .....5.10
Harvey,Ill. B5 .....4.55
LosAngeles R2 .....6.00
Mansfield,Mass. B5 .....5.10
Massillon,O. R2, R8 .....4.55
Monaca, Pa. S17 .....4.55
Newark,N.J. W18 .....5.00
Plymouth,Mich. P5 .....4.80
Pittsburgh J5 .....4.55
Putnam,Conn. W18 .....5.10
Readville,Mass. C14 .....5.10
St.Louis,Mo. M5 .....4.95
So.Chicago,Ill. W14 .....4.55
SpringCity,Pa. (5) K3 ...5.00
Struthers,O. Y1 .....4.55
Waukegan,Ill. A7 .....4.55
Youngstown F3, Y1 .....4.55

BARS, Cold-Finished Alloy
Ambridge,Pa. W18 .....5.40
BeaverFalls,Pa. M12 .....5.40
Bethlehem,Pa. B2 .....5.40
Buffalo B5 .....5.40
Camden,N.J. P13 .....5.80
Canton,O. R2 .....5.40
Canton,O.(29) T7 .....4.90
Carnegie,Pa. C12 .....5.40
Chicago W18 .....5.40
Cleveland A7 .....5.45
Cleveland C20 .....5.40
Detroit P17 .....5.55
Donora,Pa. A7 .....5.45
Elyria,O. WS 5.40
Gary,Ind. R2 .....5.40
Hammond,Ind. L2, M13..5.40
Hartford,Conn. R2 .....5.85
Harvey,Ill B5 .....5.40
Lackawanna,N.Y. B2 .....5.40
Mansfield,Mass. B5 .....5.85
Massillon,O. R2,R8 .....5.40
Midland,Pa. C18 .....5.40
Monaca,Pa. S17 .....5.40
Newark,N.J. W18 .....5.75
Plymouth,Mich. P5 .....5.80
So.Chicago,Ill. R2, W14..5.40
Struthers,O. Y1 .....5.40
Warren,O. C17 .....5.40
Waukegan,Ill. A7 .....5.45
Worcester,Mass. A7 .....5.75
Youngstown F3, Y1 .....5.40

RAIL STEEL BARS
Chicagolits.(3,4) C2 .....4.75
Chicagolits.(3,4) I-2 .....4.75
Franklin,Pa.(3,4) F5 .....4.75
FortWorth,Tex.(26) T4 ..4.85
Huntngtn,W.Va.(3) W7 ..5.50
Marion,O.(3) P11 .....4.75
Moline,Ill.(3) R2 .....5.80
Williamsport(3) S19 .....5.00
Williamsport(4) S19 .....5.10

BARS, Wrought Iron
Dover,N.J.(Staybolt)U1 15.60
Dover,(Eng.Bolt) U1 ...13.50
Dover(Wrgt.Iron) U1 ...12.25
Economy,Pa.(S.R.) B14..9.60
Economy,Pa.(D.R.)B14 11.90
Economy,(Staybolt)B14 12.20
McK.Rks.(Staybolt) L5..14.50
McK.Rks.(S.R.) L5 .....9.60
McK.Rks.(D.R.) L5 .....13.90

BARS, Reinforcing (Fabricators)
AlabamaCity,Ala. R2 ...3.70
Atlanta A11 .....4.25
Buffalo R2 .....3.70
Cleveland R2 .....3.70
Emeryville,Calif. J7 ....4.45
Fairfield,Ala. T2 .....3.70
Fontana,Calif. K1 .....4.40
Gary,Ind. U5 .....3.70
Houston,Tex. S5 .....4.10
Ind.Harbor,Ind. Y1..6.05
Johnstown,Pa. B2 .....3.70
Kansas City,Mo. S5 .....4.30
Lackawanna,N.Y. B2 ....3.70
LosAngeles B3 .....6.25
Milton,Pa. B6 .....4.20
Minnequa,Colo. C10 .....4.50
Niles,Calif. P1 .....5.05
Pittsburg,Calif. C11 .....4.40
Pittsburgh J5 .....3.70
Portland,Oreg. O4 .....4.65
Seattle B3, N14 .....4.45
So.SanFrancisco B3 ....4.45
SparrowsPoint,Md. B2 ...3.70
Struthers,O. Y1 .....3.70
Torrance,Calif. C11 .....4.40
Youngstown, R2, U5 ....3.70

BARS, Reinforcing
(Fabricated to Consumers)
Huntington,W.Va. W7 ...5.50
Johnstown, ¼-1" B2 ....4.75
LosAngeles B3 .....5.45
Marion,O. P11 .....5.00
Seattle B3, N14 .....5.55
So.SanFrancisco B3 .....5.45
Sparrows, ¼-1" B2 .....4.75
Williamsport,Pa. S19 ...5.10

SHEETS, Hot-Rolled Steel
(18 gage and heavier)
AlabamaCity,Ala. R2 ...3.60
Ashland,Ky.(8) A10 ....3.60
Butler,Pa. A10 .....3.60
Cleveland J5, R2 .....3.60
Conshohocken,Pa. A3 ....4.00
Detroit M1 .....4.40
Ecorse,Mich.(8) G5 .....3.80
Fairfield,Ala. T2 .....3.60
Fontana,Calif. K1 .....4.55
Gary,Ind. U5 .....3.50
Geneva,Utah, G1 .....3.70
GraniteCity,Ill. G4 .....4.30
Ind.Harbor,Ind. I-2, Y1..3.60
Irvin,Pa. U5 .....3.60
Lackawanna,N.Y. B2 ....3.60
Munhall,Pa. U5 .....3.60
Niles,O. N12 .....3.25
Pittsburg,Calif. C11 .....4.30
Pittsburgh J5 .....3.60
Sharon,Pa. S3 .....4.00
So.Chicago,Ill. W14 .....3.60
SparrowsPoint,Md. B2 ....3.60
Steubenville,O. W10 .....3.60
Torrance,Calif. C11 .....4.30
Warren,O. R2 .....3.60
Weirton,W.Va. W6 .....3.60
WestLeechburg,Pa. A4 ...3.75
Youngstown U5, Y1 .....3.60

SHEETS, H.R., (19 gage)
AlabamaCity,Ala. R2 475
Dover,O. R5 .....5.65
Ind.Harbor,Ind. I-2, ...5.40
Mansfield,O. E6 .....5.65
Niles,O. N12 .....5.75
Torrance,Calif. C11 .....5.40

SHEETS, H.R. (14-ga., heavier)
High-Strength Low-Alloy
Cleveland J5, R2 .....5.40
Conshohocken,Pa. A3 ....5.65
Ecorse,Mich. G5 .....5.95
Fairfield,Ala. T2 .....5.40
Fontana,Calif. K1 .....6.35
Gary,Ind. U5 .....5.40
Ind.Harbor,Ind. I-2 .....5.40
IndianaHarbor,Ind. Y1..5.90
Irvin,Pa. U5 .....5.40
Lackawanna(35) B2 .....5.40
Pittsburgh J5 .....5.40
Sharon,Pa. S3 .....5.40
So.Chicago,Ill. U5 .....5.40
SparrowsPoint(36) B2 ...5.40
Warren,O. R2 .....5.40
Weirton,W.Va. W6 .....5.75
Youngstown U5 .....5.40
Youngstown Y1 .....5.90

SHEETS, Cold-Rolled
High-Strength Low-Alloy
Cleveland J5, R2 .....6.55
Ecorse,Mich. G5 .....7.10
Fontana,Calif. K1 .....7.50
Gary,Ind. U5 .....6.55
Indiana Harbor,Ind. Y1..7.05
IndianaHarbor,Ind. I-2 ..6.55
Irvin,Pa. U5 .....6.55
Lackawanna(37) B2 .....6.55
Pittsburgh J5 .....6.55
SparrowsPoint(38) B2 ...6.55
Warren,O. R2 .....6.55
Weirton,W.Va. W6 .....6.90
Youngstown Y1 .....7.05

SHEETS, Cold-Rolled Steel (Commercial Quality)

Butler,Pa. A10	4.35
Cleveland J5, R2	4.35
Ecorse,Mich. G5	4.55
Fairfield,Ala. T2	4.35
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	5.30
Gary,Ind. U5	4.35
GraniteCity,Ill. G4	5.05
Ind.Harbor,Ind. I-2, Y1	4.35
Irvin,Pa. U5	4.35
Lackawanna,N.Y. B2	4.35
Middletown,O. A10	4.35
Pittsburg,Calif. C11	5.30
Pittsburgh J5	4.35
Sparrows Point,Md. B2	4.35
Steubenville,O. W10	4.35
Warren,O. R2	4.35
Weirton,W.Va. W6	4.35
Youngstown Y1	4.35

SHEETS, Galv'd No. 10 Steel

AlabamaCity,Ala. R2	4.80
Ashland,Ky.(8) A10	4.80
Canton,O. R2	4.80
Dover,O. R1	5.50
Fairfield,Ala. T2	4.80
Gary,Ind. U5	4.80
GraniteCity,Ill. G4	5.50
Ind.Harbor,Ind. I-2	4.80
Irvin,Pa. U5	4.80
Kokomo,Ind.(13) C16	5.20
MartinsFerry,O. W10	4.80
Niles,O. N12	6.00
Pittsburg,Calif. C11	5.55
SparrowsPoint,Md. B2	4.80
Steubenville,O. W10	4.80
Torrance,Calif. C11	5.55
Weirton,W.Va. W6	4.80

SHEETS, Galvanized No. 10, High-Strength Low-Alloy

Irvin,Pa. U5	7.20
SparrowsPoint(39) B2	6.75

SHEETS, Galvannealed Steel

Canton,O. R2	5.35
Irvin,Pa. U5	5.35
Kokomo,Ind.(13) C16	5.75
Niles,O. N12	6.55

SHEETS, ZINCGRIP Steel No. 10

Butler,Pa. A10	5.05
Middletown,O. A10	5.05

SHEETS, Electro Galvanized

Cleveland R2 (28)	5.65
Niles,O. R2 (28)	5.65
Weirton,W.Va. W6	5.50

SHEETS, Zinc Alloy

Ind.Harbor,Ind. I-2	5.70

SHEETS, Drum Body

Pittsburg,Calif. C11	4.30
Torrance,Calif. C11	4.30

SHEETS, Well Casing

Fontana,Calif. K1	5.10
Torrance,Calif. C11	5.10

BLUED Stock, 29 ga.

Yorkville,O. W10	6.80
Follansbee,W.Va.(23) F4	6.85

ROOFING SHORT TERNES (8 lb. Coated)

Gary,Ind. U5	9.50

MANUFACTURING TERNES (Special Coated)

Fairfield,Ala. T2	$7.60
Gary,Ind. U5	7.50
Irvin,Pa. U5	7.50
SparrowsPoint,Md. B2	7.60
Yorkville,O. W10	7.50

SHEETS, LT. Coated Ternes, 6 lb

Yorkville,O. W10	$8.40

SHEETS, Mfg. Ternes, 8 lb (Commercial Quality)

Gary,Ind. U5	$9.50
Yorkville,O. W10	9.50

SHEETS, Long Terne Steel (Commercial Quality)

BeechBottom,W.Va. W10	5.20
Gary,Ind. U5	5.20
Mansfield,O. E6	6.05
Middletown,O. A10	5.20
Niles,O. N12	6.00
Weirton,W.Va. W6	5.20

SHEETS, Long Terne, Ingot Iron

Middletown,O. A10	5.60

SHEETS, Enameling Iron

Ashland,Ky.(8) A10	4.65
Cleveland R2	4.65
Gary,Ind. U5	4.65
GraniteCity,Ill. G4	5.35
Ind.Harbor,Ind. I-2	4.65
Irvin,Pa. U5	4.65
Middletown,O. A10	4.65
Youngstown Y1	4.65

SHEETS, Culvert No. 16	Cu Alloy	Cu Fe
Ashland,Ky. A10	5.60	...
Canton,O. R2	5.85	6.10
Fairfield,Ala. T2	5.60	5.85
Gary U5	5.60	5.85
IndianaHarbor I-2	5.60	5.85
Irvin,Pa. U5	5.60	5.85
Kokomo,Ind. C16	6.25	...
MartinsFy.O. W10	5.60	5.85
SparrowsPt. B2	5.60	...
Torrance,Cal. C11	6.35	...

SHEETS, Culvert, No. 16 Pure Iron

Ashland,Ky. A10	5.85
Fairfield,Ala. T2	5.85

SHEETS, Hot-Rolled Ingot Iron 18 Gage and Heavier

Ashland,Ky.(8) A10	3.85
Cleveland R2	4.20
Ind.Harbor,Ind. I-2	3.85
Warren,O. R2	4.20

SHEETS, Cold-Rolled Ingot Iron

Cleveland R2	4.95
Middletown,O. A10	4.85
Warren,O. R2	4.95

SHEETS, Galvanized Ingot Iron No. 10 flat

Ashland,Ky.(8) A10	5.05
Canton,O. R2	5.55

SHEETS, ZINCGRIP Ingot Iron

Butler,Pa. A10	5.30
Middletown,O. A10	5.30

SHEETS, ALUMINIZED

Butler,Pa. A10	8.15

TINPLATE, American Coke (Base Box)	1.25 lb	1.50 lb
Aliquippa J5	$8.45	$8.70
Fairfield,Ala. T2	8.55	8.80
Gary,Ind. U5	8.45	8.70
Ind.Har. I-2, Y1	8.45	8.70
Irvin,Pa. U5	8.45	8.70
Pitts.,Cal. C11	9.20	9.45
Sp.Pt.,Md. B2	8.55	8.80
Warren,O. R2	8.45	8.70
Weirton,W.Va. W6	8.45	8.70
Yorkville,O. W10	8.45	8.70

BLACK PLATE (Base Box)

Aliquippa,Pa. J5	$6.25
Fairfield,Ala. T2	6.35
Gary,Ind. U5	6.25
GraniteCity,Ill. G4	6.45
Ind.Harbor,Ind. I-2, Y1	6.25
Irvin,Pa. U5	6.25
Niles,O. R2	6.25
Pittsburg,Calif. C11	7.00
SparrowsPoint,Md. B2	6.35
Warren,O. R2	6.25
Weirton,W.Va. W6	6.25
Yorkville,O. W10	6.25

HOLLOWARE ENAMELING Black Plate (29 gage)

Follansbee,W.Va. F4	5.85
Gary,Ind. U5	5.85
GraniteCity,Ill. G4	6.05
Ind.Harbor,Ind. Y1	5.30
Irvin,Pa. U5	5.85
Yorkville,O. W10	6.15

STRIP, Hot-Rolled Alloy

Bridgprt.Conn.(10)	S15 5.45
Carnegie,Pa. S18	5.85
Fontana,Calif. K1	6.70
Gary,Ind. U5	5.50
Houston,Tex. S5	5.90
KansasCity,Mo. S5	6.10
Midland,Pa. C18	5.85
NewBritn.Conn.(10)	S15 5.45
Sharon,Pa. S8	5.85
Youngstown U5	5.60

STRIP, Hot-Rolled, High-Strength Low-Alloy

Bessemer,Ala. T2	5.30
Conshohocken,Pa. A3	5.55
Ecorse,Mich. G5	5.95
Fairfield,Ala. T2	5.30
Fontana,Calif. K1	6.20
Gary,Ind. U5	5.30
Ind.Harb.,Ind. I-2	5.30
IndianaHarbor,Ind. Y1	5.80
Lackawanna,N.Y. B2	4.95
LosAngeles(25) B3	6.05
Seattle B3	6.30
Sharon,Pa. S3	5.40
So.SanFrancisco(25) B3	6.05
SparrowsPoint,Md. B2	4.95
Warren,O. R2	5.30
Weirton,W.Va. W6	5.75
Youngstown Y1	5.80
Youngstown U5	5.30

STRIP, Cold-Rolled, High-Strength Low-Alloy

Cleveland J5	6.70
Cleveland A7	6.55
Dover,O. G6	7.30
Fontana,Calif. K1	6.95
Lackawanna,N.Y. B2	6.40
Sharon,Pa. S3	6.55
SparrowsPoint,Md. B2	6.40
Warren,O. R2	6.55
Weirton,W.Va. W6	7.20
Youngstown Y1	7.05

STRIP, Hot-Rolled Carbon

Ala.City,Ala.(27) R2	3.50
Alton,Ill. L1	3.95
Ashland,Ky(8) A10	3.50
Atlanta A11	4.05
Bessemer,Ala. T2	3.50
Bridgeprt.Conn.(10)	S15 4.00
Buffalo(27) R2	3.50
Butler,Pa. A10	3.50
Carnegie,Pa. S18	4.00
Conshohocken,Pa. A3	3.90
Detroit M1	4.40
Ecorse,Mich. G5	3.80
Fairfield,Ala. T2	3.50
Fontana,Calif. K1	4.75
Gary,Ind. U5	3.50
Houston,Tex. S5	4.90
Ind.Harbor,Ind. I-2, Y1	3.50
Johnstown,Pa.(25) B2	3.50
KansasCity,Mo.(9) S5	4.10
Lackawanna,N.Y.(32) B2	3.50
LosAngeles B3	4.25
Milton,Pa. B6	4.00
Minnequa,Colo. C10	4.55
NewBritain(10) S15	4.00
No.Tonawanda,N.Y. B11	3.50
Pittsburg,Calif. C11	4.25
Riverdale,Ill. A1	3.50
SanFrancisco S7	4.85
Seattle B3, N14	4.50
Sharon,Pa. S3	4.00
So.Chicago,Ill. W14	3.50
So.SanFrancisco B3	4.25
SparrowsPoint,Md. B2	3.50
Torrance,Calif. C11	4.25
Warren,O. R2	3.50
Weirton,W.Va. W6	3.60
WestLeechburg,Pa. A4	3.75
Youngstown U5, Y1	3.50

STRIP, Cold-Rolled Alloy Steel

Bridgeprt.Conn.(10)	S15 10.75
Carnegie,Pa. S18	10.60
Cleveland A7	10.00
Dover,O. G6	10.50
Fontana,Calif. K1	11.65
Harrison,N.J. C18	10.60
Midland,Pa. C18	10.60

STRIP, Cold-Rolled Carbon

Anderson,Ind.(40) G6	5.50
Berea,O. C7	6.60
Bridgeprt,Conn.(10)	S15 5.35
Butler,Pa. A10	4.65
Cleveland A7, J5	4.65
Dearborn,Mich. D3	5.60
Detroit D2	5.60
Detroit M1	5.45
Dover,O.(40) G6	5.50
Ecorse,Mich. G5	4.85
Follansbee,W.Va. F4	5.35
Fontana,Calif. K1	6.30
FranklinPark,Ill.(40) T6	4.90
Ind.Harbor,Ind. I-2	4.90
Lackawanna,N.Y. B2	4.65
LosAngeles C1	6.40
Mattapan,Mass. T6	5.50
Middletown,O. A10	4.65
NewBritain(10) S15	5.35
NewCastle,Pa. B4	5.35
NewCastle(40) E5	5.25
NewHaven,Conn. D2	5.85
NewHaven,Conn. A7	5.15
Pawtucket,R.I. R3	6.00
Pawtucket,R.I.(21) N8	5.85
Riverdale,Ill.(40) A1	4.90
Rome,N.Y. R6	5.10
Sharon,Pa. S3	5.35
SparrowsPoint,Md. B2	4.65
Trenton,N.J. R5	6.00
Wallingford,Conn. W2	5.85
Warren,O. R2	4.65
Weirton,W.Va. W6	4.65
Youngstown C8 (40)	5.25
Youngstown Y1	4.65

STRIP, Electro Galvanized

Dover,O. G6	5.50
Warren,O. T5	5.25
Weirton,W.Va. W6	4.65
Youngstown C8	5.25

STRIP, Cold-Finished Spring Steel (Annealed)	0.26-0.40C	0.41-0.60C	0.61-0.80C	0.81-1.05C	1.06-1.35C
Berea,O. C7	...	6.80	7.40	9.35	11.65
Bridgeport,Conn.(10)	S15 5.35	6.80	7.40	9.35	11.65
Bristol,Conn. W1	...	...	7.70	9.65	....
Carnegie,Pa. S18	...	6.80	7.40	9.35	11.65
Cleveland A7	4.65	6.45	7.40	9.35	11.65
Dearborn,Mich. D3	5.60	7.05	7.65	....	....
Detroit D2	5.60	6.65	7.25	....	....
Dover,O. G6	5.50	6.80	7.40	9.35	11.65
FranklinPark,Ill. T6	5.00	6.60	7.55	9.50	11.80
Harrison,N.J. C18	...	...	7.70	9.65	11.95
Mattapan,Mass. T6	5.50	6.75	7.70	9.65	11.95
NewBritn.,Conn.(10)	S15 5.35	6.80	7.40	9.35	11.65
NewCastle,Pa. B4	5.35	6.80	7.40	9.35	....
NewCastle,Pa. E5	5.50	6.80	7.40	9.35	11.65
NewHaven,Conn. D2	5.85	6.75	7.35	....	....
NewYork W3	...	7.10	7.70	9.65	11.95
Pawtucket,R.I. NS:					
Cleve.orPitts.Base	...	6.80	7.40	9.35	11.65
Worcester,Mass.,Base	5.85	7.10	7.70	9.65	11.95
Sharon,Pa. S3	5.35	6.80	7.40	9.35	11.65
Trenton,N.J. R5	...	7.10	7.70	9.65	11.95
Wallingford,Conn. W2	5.85	6.75	7.35	9.30	11.60
Weirton,W.Va. W6	5.35	6.80	7.40	9.35	11.65
Worcester,Mass. A7	4.95	6.75	7.70	9.65	11.95
Worcester,Mass. T6	5.50	6.75	7.70	9.65	11.95
Youngstown C8	...	6.80	7.40	9.35	11.65
Spring Steel (Tempered)					
Trenton,N.J. R5	...	...	10.30	12.50	15.35
Harrison,N.J. C18	...	...	10.30	12.50	15.35
NewYork W3	...	...	10.30	12.50	15.35

TIN PLATE, Electrolytic (Base Box)	0.25-lb	0.50 lb	0.75lb
Aliquippa,Pa. J5	$7.15	$7.40	$7.80
Fairfield,Ala. T2	7.25	7.50	7.90
Gary,Ind. U5	7.15	7.40	7.80
GraniteCity,Ill. G4	7.35	7.60	8.00
Ind.Harbor,Ind. I-2, Y1	7.15	7.40	7.80
Irvin,Pa. U5	7.15	7.40	7.80
Niles,O. R2	7.15	7.40	7.80
Pittsburg,Calif. C11	7.90	8.15	8.55
SparrowsPoint,Md. B2	7.25	7.50	7.90
Weirton,W.Va. W6	7.15	7.40	7.80
Yorkville,O. W10	7.15	7.40	7.80

SHEETS, SILICON, H.R. or C.R.(22 Ga.) COILS (Cut Lengths ½c lower)	Field	Armature	Electric	Motor	Dynamo
BeechBottom,W.W10 (cut-lengths)	....	....	7.25	8.50	9.30
Brackenridge,Pa. A4	....	....	7.75	9.00	9.80
GraniteCity,Ill.G4 (cut lengths)	....	....	7.95	9.20	....
Ind.Harbor,Ind. I-2	6.95	7.25	(34)	....	....
Mansfield,O. E6 (cut lengths)	7.10	7.25	7.75	9.00	9.50
Niles,O. N12 (cut lengths)	....	6.75	7.25	....	....
Vandergrift,Pa. U5	....	7.25	7.75	9.00	9.80
Warren,O. R2	6.95	7.25	7.75	9.00	9.80
Zanesville,O. A10	....	7.25	7.75	9.00	9.80

SHEETS, SILICON (22 Ga. Base) Coils (Cut Length: ½c lower) Transformer Grade	72	65	58	52
BeechBottom W10 (cut lengths)	9.85	10.40	11.10	11.90
Brackenridge,Pa. A4	10.35	....	....	....
Vandergrift,Pa. U5	10.35	10.90	11.60	12.40
Warren,O. R2	10.35	....	....	....
Zanesville,O. A10	10.35	10.90	11.60	12.40

H.R. or C.R. COILS AND CUT LENGTHS, SILICON (22 Ga.)	T-100	T-90	T-80	T-73
Butler,Pa. A10 (C.R.)	....	....	14.75	15.25
Vandergrift,Pa. U5	12.90	13.75	14.75	15.25

Key to Producers

A1 Acme Steel Co.
A3 Alan Wood Steel Co.
A4 Allegheny Ludlum Steel
A7 American Steel & Wire
A8 Anchor Drawn Steel Co.
A9 Angell Nail & Chaplet
A10 Armco Steel Corp.
A11 Atlantic Steel Co.
A13 American Cladmetals Co.

B1 Babcock & Wilcox Tube
B2 Bethlehem Steel Co.
B3 Beth. Pac. Coast Steel
B4 Blair Strip Steel Co.
B5 Bliss & Laughlin Inc.
B6 Bolardi Steel Corp.
B8 Braeburn Alloy Steel
B11 Buffalo Bolt Co.
B12 Buffalo Steel Co.
B14 A. M. Byers Co.

C1 Calstrip Steel Corp.
C2 Calumet Steel Div. Borg-Warner Corp.
C4 Carpenter Steel Co.
C5 Central Iron & Steel Div. Barium Steel Corp.
C7 Cleve. Cold Rolling Mills
C8 Cold Metal Products Co.
C9 Colonial Steel Co.
C10 Colorado Fuel & Iron
C11 Columbia Steel Co.
C12 Columbia Steel & Shaft
C13 Columbia Tool Steel Co.
C14 Compressed Steel Shaft
C16 Continental Steel Corp.
C17 Copperweld Steel Co.
C18 Crucible Steel Co.
C19 Cumberland Steel Co.
C20 Cuyahoga Steel & Wire
C22 Claymont Steel Corp.

D2 Detroit Steel Corp.
D3 Detroit Tube & Steel
D4 Disston & Sons, Henry
D6 Driver Harris Co.
D7 Dickson Weatherproof Nail Co.

E1 Eastern Gas&Fuel Assoc.
E2 Eastern Stainless Steel
E4 Electro Metallurgical Co.
E5 Elliott Bros. Steel Co.
E6 Empire Steel Corp.

F2 Firth Sterling Steel
F3 Fitzsimons Steel Co.
F4 Follansbee Steel Corp.
F5 Franklin Steel Div. Borg-Warner Corp.
F6 Fretz-Moon Tube Co.
F7 Ft. Howard Steel & Wire
G1 Geneva Steel Co.
G2 Globe Iron Co.
G3 Globe Steel Tubes Co.
G4 Granite City Steel Co.
G5 Great Lakes Steel Corp.
G6 Greer Steel Co.

H1 Hanna Furnace Corp.

I-1 Igoe Bros. Inc.
I-2 Inland Steel Co.
I-3 Interlake Iron Corp.
I-4 Ingersoll Steel Div., Borg-Warner Corp.

J1 Jackson Iron & Steel Co.
J3 Jessop Steel Co.
J4 Johnson Steel & Wire Co.
J5 Jones & Laughlin Steel
J6 Joslyn Mfg. & Supply
J7 Judson Steel Corp.
J8 Jersey Shore Steel Co.

K1 Kaiser Steel Corp.
K2 Keokuk Electro Metals
K3 Keystone Drawn Steel
K4 Keystone Steel & Wire

L1 Laclede Steel Co.
L2 LaSalle Steel Co.
L3 Latrobe Electric Steel
L5 Lockhart Iron & Steel
L6 Lone Star Steel Co.
L7 Lukens Steel Co.

STRIP, Hot-Rolled Ingot Iron

Ashland,Ky. (8) A10 ...3.75
Warren,O. R2 .....4.10

STRIP, Cold-Rolled Ingot Iron

Warren,O. R2 .....5.25

TIGHT COOPERAGE HOOP

Atlanta A11 .....4.05
Riverdale,Ill. A1 .....3.90
Sharon,Pa. S3 .....4.15
Youngstown U5 .....3.75

WIRE, Merchant Quality

(6 to 8 gage)	An'ld	Galv.
Alabama City R2	5.70	5.95
Aliquippa J5	5.70	6.15
Atlanta A11	5.95	6.40
Bartonville(19) K4	5.70	6.15
Buffalo W12	4.85	...
Cleveland A7	5.70	6.15
Crawfordsville M8	5.95	6.40
Donora,Pa. A7 ..	5.70	6.15
Duluth,Minn. A7 .	5.70	6.15
Fairfield T2	5.70	6.15
Houston, Tex. S5.	6.10	6.55
Johnstown B2	5.70	6.15
Joliet, Ill. A7	5.70	6.15
KansasCy,Mo. S5.	6.30	6.75
Kokomo C16	5.80	6.05
LosAngeles B3 ..	6.65	...
Minnequa C10 ...	5.95	6.45
Monessen P7	5.95	6.40
Palmer W12	5.15	...
Pitts.Calif. C11.	6.65	6.80
Prtsmth.(18)P12 ..	5.10	6.60
Rankin A7	5.70	6.15
So.Chicago R2 ..	5.70	5.95
So.S.Fran. C10 ..	6.65	7.10
SparrowsPt. B2 ..	5.80	6.25
Sterling,Ill.(1)N15	5.70	6.15
Struthers,O. Y1 ..	5.70	6.15
Torrance,Cal. C11	6.65	...
Worcester A7	6.00	6.45

WIRE (16 gage)	An'ld	Galv. Stone	Stone
Aliquippa J5	10.15	12.15	
Bartonville(1) K4	10.25	11.95	
Cleveland A7	10.25	12.15	
Crawfrdsville M8.	10.30	12.00	
Fostoria,O. S1 ..	10.40	13.00	
Johnstown B2	10.25	12.15	
Kokomo C16	10.25	11.95	
Minnequa C10	10.40	12.40	
Palmer,Mass.C12	10.25	12.15	
Pitts.Cal. C11 ..	10.60	12.50	
Prtsmth.(18) P12	10.55	12.30	
SparrowsPt. B2 ..	10.35	12.25	
Waukegan A7	10.25	12.15	

ROPE WIRE	(A)	(B)
Alton Ill. L1	8.65	8.90
Bartonville,Ill. K4	8.55	8.80
Buffalo W12	8.55	8.80
Fostoria,O. S1 ..	8.85	9.10
Johnstown,Pa. B2	8.55	8.80
Monessen,Pa. P16	8.55	8.80
Monessen,Pa. P7 .	8.80	9.05
Palmer,Mass. W12	8.85	9.10
Portsmouth,O. P12	8.55	8.80
Roebling,N.J., R5.	8.85	9.10
SparrowsPt. B2 ..	8.65	8.90
Struthers,O. Y1 ..	8.55	8.80
Worcester J4, T6.	8.85	9.10

(A) Plow and Mild Plow.
(B) Improved Plow.

WIRE, Manufacturers Bright, Low Carbon

AlabamaCity,Ala. R2 ..4.85
Aliquippa,Pa. J5 .....4.85
Atlanta A11 .....5.10
Alton,Ill. L1 .....5.05
Bartonville,Ill.(1) K4 ...4.85
Buffalo W12 .....4.85
Chicago W13 .....5.10
Cleveland A7, C20 .....4.85
Crawfordsville,Ind. M8. .5.10
Donora,Pa. A7 .....4.85
Duluth,Pa. A7 .....4.85
Fairfield,Ala. T2 .....4.85
Fostoria,O.(24) S1 .....5.35
Houston S5 .....5.25
Johnstown,Pa. B2 .....4.85
Joliet, Ill. A7 .....4.85
KansasCity, Mo. S5 .....5.45
Kokomo,Ind. C16 .....4.95
Los Angeles B3 .....5.80
Minnequa,Colo. C10 ....5.10
Monessen,Pa. P7 .....5.10
Newark, 6-8 ga. I-1 ....5.50
No.Tonawanda B11 ....4.85
Palmer, Mass W12 .....5.15
Pittsburg, Calif. C11 ....5.80
Portsmouth,O. P12 .....5.25
Rankin,Pa. A7 .....4.85
So.Chicago,Ill. R2 .....4.85
So. SanFrancisco C10 ...5.80
SparrowsPoint,Md. B2 ..4.95
Sterling,Ill.(1) N15 ....4.85
Struthers,O. Y1 .....4.85
Torrance,Calif. C11 ....5.80
Waukegan A7 .....4.85
Worcester,Mass. A7, T6..5.15

WIRE, Cold-Rolled Flat

Anderson,Ind. G6 .....6.20
Buffalo W12 .....6.35
Cleveland A7 .....5.85
Crawfordsville,Ind. M8. .6.20
Detroit D2 .....6.20
Dover,O. G6 .....6.20
Fostoria,O. S1 .....6.00
Kokomo,Ind. C16 .....5.70
Franklin Park,Ill. T6 ...6.20
Massillon,O. R8 .....5.85
Monessen,Pa. P16 .....5.85
Monessen,Pa. P7 .....6.10
NewHaven,Conn. D2 ....6.50
Pawtucket,R.I.(12) NS. .6.85
Trenton,N.J. R5 .....6.15
Worcester A7 .....6.15
Worcester T6 .....6.50
Worcester W12 .....6.65

WIRE, Fine & Weaving(8" Coils)

Bartonville,Ill.(1) K4 ..8.90
Buffalo W12 .....8.90
Chicago W13 .....8.90
Cleveland A7 .....8.90
Crawfordsville, Ind. M8..8.95
Fostoria,O. S1 .....8.90
Johnstown,Pa. B2 .....8.90
Kokomo,Ind. C16 .....8.90
Monessen,Pa. P16 .....8.90
Palmer,Mass W12 .....9.20
Portsmouth,O. P12 .....8.90
Roebling,N.J. R5 .....9.20
Waukegan,Ill. A7 .....8.90
Worcester,Mass. A7, T6 .9.20

WIRE, Galv'd ACSR for Cores

Bartonville,Ill. K4 .....8.50
Monessen,Pa. P16 .....8.50
Roebling,N.J. R5 .....8.80
SparrowsPt.Md. B2 ..8.60
Johnstown,Pa. B2 .....8.50

WIRE, Tire Bead

Bartonville,Ill.(1) K4...10.90
Monessen,Pa. P16 ....11.40
Roebling,N.J. R5 ....11.55

WIRE, MB Spring, High Carbon

Aliquippa,Pa. J5 .....6.25
Alton,Ill. L1 .....6.45
Bartonville,Ill.(1) K4 ...6.25
Buffalo W12 .....6.25
Cleveland A7 .....6.25
Donora,Pa. A7 .....6.25
Duluth A7 .....6.25
Fostoria,O. S1 .....6.25
Johnstown,Pa. B2 .....6.25
LosAngeles B3 .....7.20
Milbury,Mass.(12) N6 ..8.05
Monessen,Pa. P7, P16..6.25
Palmer,Mass. W12 .....6.55
Pittsburg,Calif. C11 ....7.20
Roebling,N.J. R5 .....6.55
Portsmouth,O. P12 .....6.25
So.Chicago,Ill. R2 .....6.25
SoSanFrancisco C10 ...7.20
SparrowsPoint,Md. B2..6.35
Struthers,O. Y1 .....6.25
Trenton,N.J. A7 .....6.55
Waukegan,Ill. A7 .....6.25
Worcester A7, T6, W12..6.55
Worcester,Mass J4 .....6.75

WIRE, Upholstery Spring

Aliquippa,Pa. J5 .....5.90
Alton,Ill. L1 .....6.10
Buffalo W12 .....5.90
Cleveland A7 .....5.90
Donora,Pa. A7 .....5.90
Duluth,Minn. A7 .....5.90
Johnstown,Pa. B2 .....5.90
LosAngeles B3 .....6.85
Monessen,Pa. P7, P16 ..5.90
NewHaven,Conn. A7 ....6.20
Palmer,Mass. W12 .....6.20
Pittsburg,Calif. C11 ....6.85
Portsmouth,O. P12 .....5.90
Roebling,N.J. R5 .....6.20
So.Chicago,Ill. R2 .....5.90
So.SanFrancisco C10 ...6.85
SparrowsPoint,Md. B2 ..6.00
Torrance,Calif. C11 ....6.85
Trenton,N.J. A7 .....6.20
Waukegan,Ill. A7 .....5.90
Worcester,Mass. A7 .....6.20

WOVEN FENCE, 9-15½ Ga. Col.

AlabamaCity,Ala. R2 ...126
Ala.City,Ala.,17-18ga.R2 213
Aliquippa,Pa.9-14½ga.J5 130
Atlanta A11 133
Bartonville,Ill.(19) K4 ...130
Crawfordsville,Ind. M8 ..132
Donora,Pa. A7 130
Duluth,Minn. A7 130
Fairfield,Ala. T2 130
Houston,Tex. S5 138
Johnstown,Pa. B2 130
Johnstown,17ga..6" ..204
Johnstown,17ga..4" B2 ..207
Joliet,Ill. A7 130
KansasCity,Mo. S5 142
Kokomo,Ind. C16 132
Minnequa,Colo. C10 138
Monessen,Pa. P7 135
Pittsburg,Calif. C11 153
Portsmouth,O.(18) P12 ..137
Rankin,Pa. A7 130
So.Chicago,Ill. R2 126
Sterling,Ill.(1) N15 130

FENCE POSTS

ChicagoHts.,Ill. C2 140
Duluth,Minn. A7 125
Franklin,Pa. F5 140
Huntington,W.Va. W7 140
Johnstown,Pa. B2 140
Marion,O. P11 140
Minnequa,Colo. C10 130
Moline,Ill. R2 136
So.Chicago R2 140
Tonawanda,N.Y. B12 140
Williamsport,Pa. S19 150

WIRE, Barbed	Col.
AlabamaCity,Ala. R2	136
Aliquippa,Pa. J5	140
Atlanta A11	143
Bartonville,Ill.(19) K4	143
Crawfordsville,Ind. M8	145
Donora,Pa. A7	140
Duluth,Minn. A7	140
Fairfield,Ala. T2	140
Houston,Tex. S5	148
Johnstown,Pa. B2	140
Joliet,Ill. A7	140
KansasCity,Mo. S5	152
Kokomo,Ind. C16	142
Minnequa,Colo. C10	146
Monessen,Pa. P7	145
Pittsburg,Calif. C11	160
Portsmouth,O.(18) P12	147
Rankin,Pa. A7	140
So.Chicago,Ill. R2	136
So.SanFran.,Calif. C10	160
SparrowsPoint,Md. B2	142
Sterling,Ill.(1) N15	140

BALE TIES, Single Loop	Col.
AlabamaCity,Ala. R2	123
Atlanta A11	126
Bartonville,Ill.(19) K4	123
Crawfordsville,Ind. M8	132
Donora,Pa. A7	123
Duluth,Minn. A7	123
Fairfield,Ala. T2	123
Joliet,Ill. A7	123
KansasCity,Mo. S5	135
Kokomo,Ind. C16	125
Minnequa,Colo. C10	128
Pittsburg,Calif. C11	147
So.Chicago,Ill. R2	123
So.SanFran.,Calif. C10	147
SparrowsPoint,Md. B2	125
Sterling,Ill.(1) N15	123

NAILS & STAPLES, Non-Stock

AlabamaCity,Ala. R2 ...6.10
Bartonville,Ill.(19) K4 ..5.95
Crawfordsville,Ind. M8 ..6.30
Donora,Pa. A7 .....5.95
Duluth,Minn. A7 .....5.95
Johnstown,Pa. B2 .....5.95
Joliet,Ill. A7 .....5.95
Kokomo,Ind. C16 .....6.05
Minnequa,Colo. C10 ....6.20
Pittsburg,Calif. C11 ....6.90
Portsmouth,O. P12 .....6.25
Rankin,Pa. A7 .....5.95
So.Chicago,Ill. R2 .....6.10
SparrowsPoint,Md. B2 ..6.06
Sterling,Ill.(1) N15 ....5.65
Worcester,Mass. A7 .....6.25

NAILS, Cut (100 lb keg)	
To dealers (33)	
Conshohocken,Pa. A3	$7.35
Wheeling,W.Va. W10	7.35

RAILS	Std. No. 1	Std. No. 2	All No. 2	Tee Rails 60 lb Under
Bessemer,Pa. U5	3.60	3.50	3.55	4.00
Ensley,Ala. T2	3.60	3.50	...	4.00
Fairfield,Ala. T2	...	...	...	4.00
Gary,Ind. U5	3.60	3.50	3.55	...
Huntington,W.Va. W7	...	...	...	5.00
Ind.Harbor,Ind. I-2	3.60	3.50	3.55	...
Johnstown,Pa. B2	...	...	...(16)4.00	
Lackawanna B2	3.60	3.50	...	4.00
Minnequa,Colo. C10	3.60	3.50	...	4.50
Steelton,Pa. B2	3.60	3.50	...	...
Williamsport,Pa. S19	...	...	...	4.75

NAILS & STAPLES, Stock

To dealers & mfrs. (1)	Col.
AlabamaCity,Ala. R2	118
Aliquippa,Pa.(13) J5	118
Atlanta A11	121
Bartonville,Ill.(19) K4	118
Chicago,Ill. W13	118
Cleveland A9	125
Crawfordsville,Ind. M2	122
Donora,Pa. A7	118
Duluth,Minn. A7	118
Fairfield,Ala. T2	118
Galveston,Tex. D7	126
Houston,Tex. S5	126
Johnstown,Pa. B2	118
Joliet,Ill. A7	118
KansasCity,Mo. S5	130
Kokomo,Ind. C16	120
Minnequa,Colo. C10	123
Monessen,Pa. P7	124
Pittsburg,Calif. C11	137
Portsmouth,O. P12	124
Rankin,Pa. A7	118
So.Chicago,Ill. R2	118
SparrowsPoint,Md. B2	120
Sterling,Ill.(1) N15	118
Torrance,Calif. C11	138
Worcester,Mass. A7	124

STANDARD TRACK SPIKES

Ind.Harbor,Ind. I-2, Y1..6.15
KansasCity,Mo. S5 ....6.40
Lebanon,Pa. B2 .....6.15
Minnequa,Colo. C10 ....6.15
Pittsburgh J5 .....6.15
Seattle B3 .....6.65
So.Chicago,Ill. R2 .....6.15
Struthers,O. Y1 .....6.15
Youngstown R2 .....6.15

TRACK BOLTS (20) Treated

KansasCity,Mo. S5 .....9.85
Lebanon,Pa.(32) B2 ...9.85
Minnequa,Colo. C10 ....9.85
Pittsburgh O3, P14 ....9.85
Seattle B3 .....10.35

TIE PLATES

Fairfield,Ala. T2 .....4.50
Gary,Ind. U5 .....4.50
Ind.Harbor,Ind. I-2 ....4.50
Lackawanna,N.Y. B2 ....4.50
Minnequa,Colo. C10 ....4.50
Pittsburg,Calif. C11 ....4.65
Seattle B3 .....4.65
Steelton,Pa. B2 .....4.50
Torrance,Calif. C11 ....4.65

JOINT BARS

Bessemer,Pa. U5 .....4.70
Fairfield,Ala. T2 .....4.70
Ind.Harbor,Ind. I-2 ....4.70
Joliet,Ill. U5 .....4.70
Lackawanna,N.Y. B2 ....4.70
Minnequa,Colo. C10 ....4.70
Steelton,Pa. B2 .....4.70

AXLES

Ind.Harbor,Ind. S18 ...5.60
Johnstown,Pa. B2 .....5.60

Key to Producers

M1 McLouth Steel Corp.
M4 Mahoning Valley Steel
M5 Medart Co.
M6 Mercer Tube & Mfg. Co.
M8 Mid-States Steel & Wire
M9 Midvale Co.
M12 Moltrup Steel Products
M13 Monarch Steel Co.
M14 McInnes Steel Co.

N2 National Supply Co.
N3 National Tube Co.
N5 Nelsen Steel & Wire Co.
N6 NewEng-HighCarb.,Wire
N8 Newman-Crosby Steel
N12 Niles Rolling Mill Co.
N14 Nrthwest. Steel Roll. Mills
N15 Northwestern S.&W. Co.
N16 New Delphos Mfg. Co.

O3 Oliver Iron & Steel Corp.
O4 Oregon Steel Mills

P1 Pacific States Steel Corp.
P2 Pacific Tube Co.
P4 Phoenix Iron & Steel Co.
P5 Pilgrim Drawn Steel
P6 Pittsburgh Coke & Chem.
P7 Pittsburgh Steel Co.
P9 Pittsburgh Tube Co.
P11 Pollak Steel Co.
P12 Portsmouth Division, Detroit Steel Corp.
P13 Precision Drawn Steel
P14 Pitts. Screw & Bolt Co.
P15 Pittsburgh Metallurgical
P16 Page Steel & Wire Div., Amer. Chain & Cable
P17 Plymouth Steel Co.

R1 Reeves Steel & Mfg. Co.
R2 Republic Steel Corp.
R3 Rhode Island Steel Corp.
R5 Roebling's Sons, John A.
R6 Rome Strip Steel Co.
R7 Rotary Electric Steel Co.
R8 RellanceDiv.,EatonMfg.

S1 Seneca Wire & Mfg. Co.
S3 Sharon Steel Corp.
S5 Sheffield Steel Corp.
S6 Shenango Furnace Co.
S7 Simmons Co.
S8 Simonds Saw & Steel Co.
S9 Sivyer-Sheffield, S.&I. Co.
S13 Standard Forgings Corp.
S14 Standard Tube Co.
S15 Stanley Works
S16 Struthers Iron & Steel
S17 Superior Drawn Steel Co.
S18 Superior Steel Corp.
S19 Sweet's Steel Co.
S20 Southern States Steel
T2 Tenn. Coal, Iron & R.R.
T3 Tenn. Prod. & Chem.
T4 Texas Steel Co.
T5 Thomas Steel Co.
T6 Thompson Wire Co.
T7 Timken Roller Bearing
T9 Tonawanda Iron Div. Am. Rad. & Stan. San.
U1 Ulster Iron Works
U4 Universal Cyclops Steel
U5 United States Steel Co.
V2 Vanadium-Alloys Steel
V3 Vulcan Crucible Steel Co.
W1 Wallace Barnes Co.
W2 Wallingford Steel Co.
W3 Washburn Wire Co.
W4 Washington Steel Corp.
W6 Weirton Steel Co.
W7 W. Va. Steel & Mfg. Co.
W8 West.Auto.Mach.Screw
W9 Wheatland Tube Co.
W10 Wheeling Steel Corp.
W12 Wickwire Spencer Steel Div., Colo. Fuel & Iron
W13 Wilson Steel & Wire Co.
W14 Wisconsin Steel Div. International Harvester
W15 Woodward Iron Co.
W18 Wyckoff Steel Co.
Y1 YoungstownSheet&Tube

TOOL STEEL

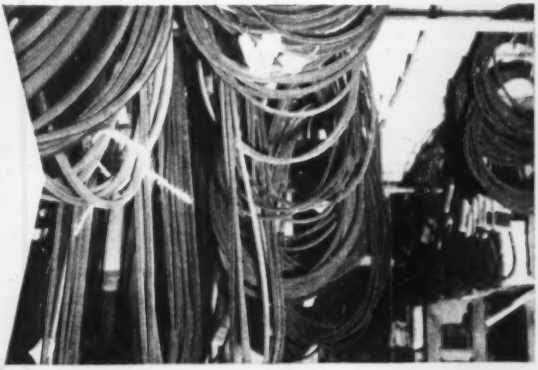
—Grade by Analysis—

Grade	$ per lb	W	Cr	V	Co	Mo	$ per lb
Reg. Carbon .	0.230	20.25	4.25	1.6	12.25	..	3.535-3.675
Extra Carbon	0.270	19	4	2	7	..	2.460
Spec. Carbon.	0.325	18.25	4.25	1	4.75	..	2.125
Oil Hardening .	0.350	18	4	2	9	..	2.445-2.450
5%CrHotWrk	0.350	13.5	4	3	..	..	1.60¼
Hi-Carbon-Cr.	0.635	6.4	4.5	1.9	..	5	0.96-0.965
18W,4Cr,1V .	1.505	6	4	3	..	6	1.190
18W,4Cr,2V .	1.650	1.5	4	1	..	8.5	0.810

Tool steel producers include: A4, A8, B2, B8, C4, C9, C13, C18, D4, F2, J3, L3, M14, S8, U4, V2, V3.

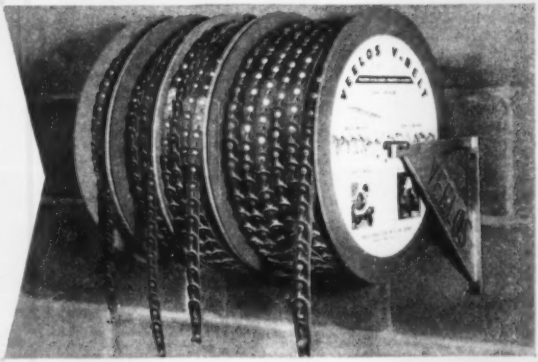
(1) Chicago base.
(2) Angles, flats, bands.
(3) Merchant. (4) Reinforcing.
(5) Philadelphia del.
(6) Chicago or Birm. base.
(7) To jobbers, 3 cents lower.
(8) 16 gage and heavier.
(9) 18 in. and narrower.
(10) Pittsburgh base.
(11) Cleveland & Pittsburgh base.
(12) Worcester, Mass. base.
(13) Add 0.10c for 17 Ga. & heavier.
(14) Also wide flange beams.
(15) ⅛" and thinner.
(16) 40 lb and under.
(17) Flats only.
(18) To dealers.
(19) Chicago & Pittsburgh base.
(20) Deduct 0.25c for untreated.
(21) New Haven, Conn. base.
(22) Del. San Fran. Bay area.
(23) 28 Ga. 36" wide.
(24) Deduct 0.20c, finer than 15 Ga.
(25) Bar mill bands.
(26) Reinforcing, mill lengths, to fabricators; to consumers, 0.50c.
(27) Bar mill sizes.
(28) Bonderized.
(29) Subject to 10% increase.
(30) Sheared: add 0.35c for universal mill.
(31) Not annealed.
(32) Rd. edge or square edge.
(33) To jobbers, deduct 20 cents.
(34) 7.25c for cut lengths.
(35) 12" and narrower.
(36) 54" and narrower.
(37) 15 gage & lighter: 60" & narrower.
(38) 14 gage & lighter: 48" & narrower.
(39) 48" and narrower.
(40) Lighter than 0.035"; 0.035" and heavier, 0.25c higher.

You Waste Money Here with Endless V-Belts...



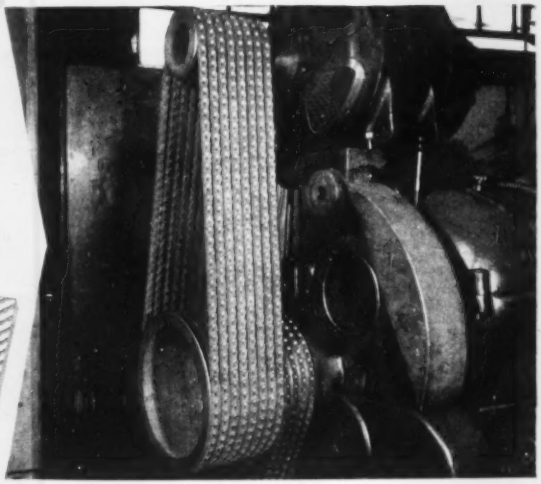
because it takes *extra* dollars to keep a complete stock of different sizes of endless v-belts . . . *extra* dollars to provide adequate storage space . . . *extra* dollars to maintain an accurate inventory control . . . and *extra* dollars in an inventory of belts that may deteriorate before they can be put into service.

but You Save Money Here with Veelos V-Belt...



because these 4 reels of Veelos *adjustable* v-belt in the O, A, B and C widths will replace up to 316 sizes of endless v-belts. Veelos on reels is easy to store on the wall or floor . . . easy to control, for a glance tells you stock on hand. And Veelos holds inventory investment dollars to a minimum while providing *the right size v-belt when you need it*—without delay, without deterioration.

and You Make Money Here on Continuous Production...



because Veelos *keeps* your machines producing. Profit-killing downtime for belt installation is practically eliminated. Veelos installs quickly—on some drives in less than one-tenth the time of endless v-belts because it is unnecessary to dismantle outboard bearings. Simple adjustment permits easy maintenance of uniform tension on all belts . . . assures constant, vibrationless, full power delivery.

For the complete story on Veelos, the adjustable v-belt, write for your copy of the VEELOS DATA BOOK.

VEELOS
THE LINK
V-BELT

ADJUSTABLE TO ANY LENGTH • ADAPTABLE TO ANY DRIVE

Made in all widths in three types: regular, oil-proof, static conducting. Also double V in A and B. Package on reels in 100-foot lengths. Sales engineers in principal cities; over 350 distributors throughout the country. VEELOS is known as VEELINK outside the United States.

MANHEIM MANUFACTURING & BELTING COMPANY, MANHEIM, PA.

STANDARD PIPE, T. & C.

BUTTWELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % —Black— A	B	C	—Galvanized— D	E	F
⅛	5.5c	0.24	34.0	32.0	29.0	1.5	+0.5	+3.5
¼	6.0	0.42	28.5	26.5	23.5	+1.0	+3.0	+6.0
⅜	6.0	0.57	23.5	21.5	18.5	+7.0	+9.0	+12.0
½	8.5	0.85	36.0	34.0	35.0	14.0	12.0	13.0
¾	11.5	1.18	39.0	37.0	38.0	18.0	16.0	17.0
1	17.0	1.68	41.5	39.5	40.5	21.5	19.5	20.5
1¼	25.0	2.28	42.0	44.0	41.0	22.0	24.0	21.0
1½	27.5	2.78	42.5	41.5	41.5	23.0	21.5	22.0
2	37	3.68	43.0	41.0	42.0	23.5	21.5	22.5
2½	58.5	5.82	43.5	41.5	42.5	24.0	22.0	23.0
3	76.5	7.62	43.5	41.5	42.5	24.0	22.0	23.0

Column A: Etna, Pa. N2; Butler, Pa. ⅛-⅜", F6; Benwood, W. Va., 3½ points lower on ⅛", 1½ points lower on ¼", and 2 points lower on ⅜", W10; Sharon, Pa. M6, 1 point higher on ⅛", 2 points lower on ½" and ¾". Following make ½" and larger: Lorain, O., N3; Youngstown R2 and 36¼% on 3½" and 4"; Youngstown Y1; Aliquippa, Pa. J5; Fontana, Calif. K1 quotes 11½ points lower on ½" and larger continuous weld and 24½ on 3½" and 4". Columns B & E: Sparrows Point, Md. B2.

Columns C & F: Indiana Harbor, Ind., ½" through 3", Y1; Alton, Ill., 2 points lower discount L1.

Column D: Butler, Pa. F6, ⅛-⅜"; Benwood, W. Va. W10, except plus 3½% on ⅛" plus 2½% on ¼", plus 9% on ⅜"; Sharon, Pa. M6, plus 0.5 on ¼", 1 point lower on ½", ¾", 1½ points lower on 1" and 1¼", 2 points lower on 1½", 2", 2½" and 3". Following quote only on ½" and larger: Lorain, O. N3; Youngstown R2, and 16½% on 3½" and 4". Youngstown Y1. Aliquippa, Pa. J5 quotes 1 point lower on ⅜", 2 points lower on 1", 1½ points lower on 1¼", 2 points lower on 1½" and 2", 3½ points lower on 2½" and 3"; Etna, Pa. N2 and 18½% on 3½" and 4".

Column A: Aliquippa J5; Ambridge N2; Lorain N3; Youngstown Y1.

Column B: Aliquippa J5 quotes 1½ pts lower on 2", 1 pt lower on 2½-6 in.; Lorain N3; Youngstown Y1.

Columns C & D: Youngstown R2.

SEAMLESS AND ELECTRIC WELD Size Inches	List Per Ft	Pounds Per Ft	Carload Discounts from List, % Seamless Black A	Galv. B	Elec. Weld Black C	Galv. D
2	37.0c	3.68	29.5	9.5	29.5	9.5
2½	58.5	5.82	32.5	12.5	32.5	12.5
3	76.5	7.62	32.5	12.5	32.5	12.5
3½	92.0	9.20	34.5	14.5	34.5	14.5
4	$1.09	10.89	34.5	14.5	34.5	14.5
5	1.48	14.81	37.0	17.0	37.0	17.0
6	1.92	19.18	37.0	17.0	37.0	17.0

BOILER TUBES

Net base c.l. prices, dollars per 100 ft. mill; minimum wall thickness, cut lengths 10 to 24 ft, inclusive.

O.D. In.	B.W. Ga.	—Seamless— H.R.	C.D.	Elec. Weld H.R.	C.D.
1	13	13.43	16.47	15.36	15.36
1¼	13	16.09	19.71	15.61	18.19
1½	13	17.27	21.15	17.25	20.30
1¾	13	19.29	23.62	19.62	23.09
2	13	21.62	26.48	21.99	25.86
2¼	13	24.35	29.82	24.50	28.84
2¼	12	26.92	32.97	26.98	31.76
2½	12	29.65	36.32	29.57	34.76
2¾	12	32.11	39.33	31.33	36.84
3	12	34.00	41.64	32.89	38.70

CLAD STEELS

(Cents per pound)

Cladding Stainless	—Plates— Carbon Base 10%	20%	—Strip— Cold-Rolled Carbon Base 10%	Sides	—Sheets— Carbon Base 10%	20%	Cu Base Both Sides
302	....	....	....	....	19.75	26.24–27.50	77.00
304	25.00	29.50	....	....	24.50	27.50–27.77	77.00
309	30.50	35.00	....	....	....	....	....
310	36.50	41.00	....	....	....	....	144.00
316	29.50	34.00	....	....	26.00	35.92–36.50	....
317	34.50	39.00	....	....	....	....	....
318	33.50	38.00	....	....	....	....	....
321	26.50	31.00–32.00	....	....	23.00	33.00	111.00
347	27.50	32.00	....	....	24.00	33.50–33.83	130.00
405	21.25	27.75	....	....	....	....	....
410	20.75	27.25	....	....	....	....	....
Nickel	33.55	45.15	41.00	54.00	....	....	....
Inconel	41.23	54.18	....	....	....	....	165.00
Monel	34.93	46.28	....	....	....	....	....
Copper*	....	....	23.70†	29.65‡	....	....	....

* Deoxidized. † 20.20c for hot-rolled. ‡ 26.40c for hot-rolled. Production points for carbon base products: Stainless plates, sheet, Conshohocken, Pa. A3 and New Castle, Ind. I-4; stainless-clad plates, Claymont, Del. C22, Coatesville, Pa. L7 and Washington, Pa. J3; nickel, inconel, monel-clad plates, Coatesville L7; nickel, copper-clad strip, Carnegie, Pa., S18. Production point for copper-base sheets is Carnegie, Pa. A13.

BOLTS, NUTS

CARRIAGE, MACHINE BOLTS

(F.o.b. midwestern plants; per cent off list for less than case lots to consumers)

6 in. and shorter:

½-in. & smaller diam.	15
⅝-in. & ⅝-in.	18.5
¾-in. and larger	17.5
Longer than 6 in.:	
All diams.	14
Lag bolts, all diams.:	
6 in. and shorter	23
over 6 in. long	21
Ribbed Necked Carriage	18.5
Blank	34
Plow	34
Step, Elevator, Tap, and Sleigh Shoe	21
Tire bolts	12
Boiler & Fitting-Up bolts	31

NUTS

	Reg.	Hvy.
H.P. & C.P. Square:		
½-in. & smaller	15	15
⅝-in. & ⅝-in.	12	6.5
¾-in.-1 ½-in.	9	1
1⅝-in. & larger	7.5	1
H.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	16.5	6.5
¾-in.-1 ½-in.	12	2
1⅝-in. & larger	8.5	2
C.P. Hex.:		
½-in. & smaller	26	22
⅝-in. & ⅝-in.	23	17.5
¾-in. & 1½-in.	19.5	12
1⅝-in. & larger	12	6.5

SEMIFINISHED NUTS

American Standard

(Per cent off list for less than case or key quantities)

	Reg.	Hvy.
½-in. & smaller	35	28.5
⅝-in. & ⅝-in.	29.5	22
¾-in.-1 ½-in.	24	15
1⅝-in. & larger	13	8.5
	Light	
⅞-in. & smaller	35	
½-in. to ⅝-in.	28.5	
¾-in. to 1½-in.	26	

STEEL STOVE BOLTS

(F.o.b. plant; per cent off list in packages)

Plain finish	48 & 10
Plated finishes	31 & 10

HEXAGON CAP SCREWS

(1020 steel; packaged; per cent off list)

6 in. or shorter:

⅝-in. & smaller	42
¾-in. through 1 in.	34
Longer than 6 in.:	
⅝-in. & smaller	26
¾-in. through 1 in.	4

SQUARE HEAD SET SCREWS

(Packaged; per cent off list)

1 in. diam. x 6 in. and shorter	38
1 in. and smaller diam. x over 6 in.	26

HEADLESS SET SCREWS

(Packaged; per cent off list)

No. 10 and smaller	35
¼-in. diam. & larger	16
N.F. thread, all diams.	10

RIVETS

F. o. b. midwestern plants

Structural ½-in., larger 7.85c

⅞-in. under ..... 36 off

WASHERS, WROUGHT

F.o.b. shipping point, to jobbers ..List to list-plus-$1.

FLUORSPAR

Metallurgical grade, f. o. b. shipping point, in Ill., Ky., net tons, carloads, effective CaF_2 content, 70%, $43; 60-67, $40.

Imported, net ton, duty paid, metallurgical grade, $33-$35.

ELECTRODES

(Threaded, with nipples, unboxed, f.o.b. plant)

GRAPHITE

—Inches— Diam.	Length	Cents per lb
17 to 20	60-72	17.85
8 to 16	48-60-72	17.85
7	48-60	19.57
6	48-60	20.95
	Per ton bulk, ovens	

CARBON

35-40	110	8.03
30	65-84-110	8.03
24	72 to 104	8.03
17 to 20	34-90	8.03

STAINLESS STEEL

Type	Sheets	C.R. Strip	Bars Wire Structurals
301...	41.00	34.00	31.25
302...	41.25	36.75	31.50
303...	43.25	40.25	34.00
304...	43.25	38.75	33.00
309...	56.00	55.00	44.75
316...	57.00	59.00	49.25
321...	49.25	48.25	37.00
347...	53.75	52.25	41.50
410...	36.50	30.50	25.75
416...	37.00	37.00	26.25
420...	44.00	47.00	31.25
430...	39.00	31.00	26.25
501...	27.50	26.00	14.25
502...	28.50	27.00	15.25

Bait., Types 301-347 sheet, quotes slight variations on Types 301-347.

Bridgeville, Pa., bars, wire, except 303 and 309 E2.

Brackenridge, Pa., sheets A4 sheets & strip U4.

Butler, Pa., sheets and strip except Types 303, 309, 416, 420, 501 & 502, A10.

Carnegie, Pa., sheets and strip except Types 303, 416, 501 & 502 and 0.25c lower on Types 302, 304, 321, 347; 0.50c lower on Types 309 and 316 S18.

Cleveland, strip A7.

Detroit, strip M1 quotes 34.00 on Type 301; 36.50, 302; 38.50, 304; 58.50, 316; 52.00, 347; 30.50, 410; 31.00, 430.

Dunkirk, N. Y., bars, wire A4 quotes slight variations on Types 301-347.

Duquesne, Pa., bars U5.

Fort Wayne, Ind., bars and wire, except Types 501 & 502 J6 quotes slight variations on Types 301-347.

Gary, Ind., sheets except Type 416 U5.

Harrison, N. J., strip and wire C18.

Massillon, O., all items, R2.

McKeesport, Pa., strip, Type 410; bars & wire, Types 410 through 430 and 31.25c on Type 302, 33.75c on 303, 32.75c on 304, 48.75c on 316, 36.75c on 321, 41.25c on 347 F2.

McKeesport, Pa., bars, sheets except Type 416 U5.

Middletown, O., sheets and strip except Types 303, 416, 420, 501 and 502 A10.

Midland, sheets & Strip C18.

Munhall, Pa., bars U5.

Pittsburgh, sheets C18.

Reading, Pa., strip except 34.25c on Type 301 and 56.00c on 309; bars, except 31.50c on Type 301 and 43.25c on 309 C4.

Sharon, Pa., strip, except Types 303, 309, 416, 501, 502 and 34.25c on Type 301 S3.

So. Chicago, Ill., bars & structurals U5.

Syracuse, N. Y., bars, wire & structurals C18.

Titusville, Pa., bars, U4.

Wallingford, Conn., strip, W2 quotes 0.25c higher.

Washington, Pa., bars, sheets & strip, except 0.25c higher on Type 301 J3.

Washington, Pa., Types 301 through 347 sheets & strip except 303, 309, 316 sheets 62.00, strip 64.00 W4.

Watervliet, N. Y., structurals & bars A4 quotes slight variations on Types 301-347.

Waukegan, bars & wire A7.

West Leechburg, Pa., strip, A4 quotes slight variations on Types 301-347.

Youngstown, strip, except Types 303, 309, 316, 416, 501 and 502 and 34.25 on Type 301.

COAL CHEMICALS

Spot, cents per gallon, ovens

Pure benzol	30.00-35.00
Toluol, one deg.	26.00-33.00
Industrial xylol	23.00-33.50

Per ton bulk, ovens

Sulphate of ammonia	$32-$45

Cents per pound, ovens

Phenol, 40 (carlots, non-returnable drums)	17.25

METAL POWDERS

(Per pound, f.o.b. shipping point in ton lots for minus 100 mesh, except as otherwise noted)

Sponge iron	Cents
98+% Fe, carlots	16.00
Swedish, c.l.f. New York, in bags	7.40-8.50
Electrolytic Iron: Annealed, 99.5% Fe.	42.50
Unannealed, 99 + % Fe	36.50
Unannealed, 99 + % Fe (minus 325 mesh)	58.50
Powder Flakes	48.50
Carbonyl Iron: 97.9-99.8%, size 5 to 10 microns	$3.00-148.00
Aluminum, Carlots, freight allowed	29.50
Atomized, 500 lb drums, freight allowed	33.50
Brass, 10-ton lots	30.00-33.25
Bronze, 10-ton lots	51.25-60.00
Phosphor-Copper, 10 ton lots	50.00
Copper: Electrolytic	43.25
Reduced	33.75-37.00
Lead	25.50
Magnesium	75.00-85.00
Manganese: Minus 100-mesh	57.00
Minus 35 mesh	52.00
Minus 200 mesh	62.00
Nickel unannealed	83.00
Nickel-Silver, 10-ton lots	44.00
Silicon	38.50
Solder (plus cost of metal)	8.50
Stainless Steel, 302	83.00
Zinc, 10-ton lots	23.00-30.50
Tungsten	Dollars
99%, minus 80 to 200 mesh, freight allowed: 1000 lb and over	4.00
Less than 1000 lb	4.15
98.8% minus 65 mesh, freight allowed: 1000 lb and over	4.15
Less than 1000 lb	4.25
Molybdenum: 99%, minus 80 to 200 mesh, over 500 lb	2.85
200 to 500 lb	3.10
less than 200 lb	3.25
Chromium, electrolytic 99% Cr min.	3.50

METALLURGICAL COKE

Price per net ton

BEEHIVE OVENS

Connellsvill,fur.	$14.50-15.00
Connellsvill,fdry.	17.00-18.00
New River foundry	21.30
Wise county, foundry	13.95
Wise county, furnace	15.20

OVEN FOUNDRY COKE

Kearny, N. J., ovens	$22.75
Everett, Mass., ovens	
New England, del.	*24.80
Chicago ovens	23.00
Chicago, del.	24.40
Terre Haute, ovens	22.50
Milwaukee, ovens	23.75
Indianapolis, ovens	22.75
Chicago, del.	26.42
Cincinnati, del.	25.85
Detroit, del.	26.85
Ironton, O., ovens	22.50
Cincinnati, del.	25.12
Painesville, O., ovens	24.00
Cleveland, del.	25.82
Erie, Pa., ovens	23.50
Birmingham, ovens	20.30
Birmingham, del.	21.60
Philadelphia, ovens	22.70
Nevillelsland,Pa.,ovens	23.00
Swedland, Pa., ovens	22.60
St. Louis, ovens	
St. Louis, del.	25.40
Portsmouth, O., oven.	22.50
Cincinnati, del.	25.12
Detroit, ovens	24.00
Detroit, del.	25.00
Buffalo, del.	26.89
Flint, del.	26.59
Pontiac, del.	25.47
Saginaw, del.	26.92

* Or within $4.15 freight zone from works.

Here's the new DINGS "standard" for Lifting Magnets

LOOK RIGHT for the features that make this new all-welded Dings the answer to a crane operator's prayer. It's the most advanced magnet on the market — the biggest lifting magnet development in years. Back of it is Dings' 52 years' experience as the world's largest exclusive builder of magnetic separators and lifting magnets for all industry.

Let the Dings' Representative nearby tell you how the many exclusive Dings' features mean dollars to you. Call him up.

FEATURES

1. LIGHT WEIGHT — up to 21% lighter in some sizes than any other magnet. More of the weight your crane carries will be payload.
2. ALL WELDED CONSTRUCTION—greater shock resistance, moisture-proof.
3. MORE LIFT — after a full day's operation, size for size the new Dings will lift from 10 to 100% more than any other. This is due to (1) its extremely low temperature rise and (2) a properly balanced magnetic circuit.
4. FOUR POINT CHAIN SUSPENSION — less swinging and "tipping" when picking up a load not properly centered — added chain life.
5. EXTRA HEAVY REINFORCED MANGANESE COIL SHIELD — strength where it's needed—25% more protection for the coils.
6. HEAVY LUGS for tag line or drag line service.
7. LEAD CABLE PROTECTED by a metal shield. Cable connection at the center of the magnet body.
8. WATER PROOF, SHATTER PROOF jerk resistant molded neoprene neck cable connectors.
9. TAMPER PROOF sealed terminal box.
10. ALLEN-BRADLEY controls.

DINGS MAGNETIC SEPARATOR COMPANY
4710 W. Electric Ave., Milwaukee 46, Wis.

Dings Magnets

World's Largest Exclusive Builder of Magnetic Separators and Lifting Magnets

SEND FOR LIFTING MAGNET CATALOG

gives full description, sizes, capacities, etc.

WAREHOUSE STEEL PRODUCTS

(Prices, cents per pound, for delivery within switching limits, subject to extras)

	SHEETS			STRIP		BARS			Standard Structural Shapes	PLATES	
	H.R. 18 Ga., Heavier*	C.R.	Gal. 10 Ga.†	H.R.*	C.R.*	H.R. Rds.	C.F. Rds.	H.R. Alloy 4140‡		Carbon	Floor
New York (city)	6.27	7.29	8.44	6.59	...	6.42	7.29	9.25	6.40	6.58	8.04
New York(c'try)	5.97	6.99	8.14	6.29	...	6.12	6.99	8.95	6.10	6.28	7.74
Boston (city)	6.40	7.20	8.49	6.35	...	6.25	7.04	9.25	6.40	6.98	7.88
Boston (c'try)	6.20	7.00	8.29	6.15	...	6.05	6.84	9.05	6.20	6.78	7.68
Phila. (city)	6.15	7.05	8.25	6.35	...	6.30	7.11	8.90	6.15	6.30	7.40
Phila. (c'try)	5.90	6.80	8.00	6.10	...	6.05	6.86	8.65	5.90	6.05	7.15
Balt. (city)	5.80	7.04	8.27	6.24	...	6.24	7.09	...	6.34	6.00	7.64
Balt. (c'try)	5.60	6.84	8.07	6.04	...	6.04	6.89	...	6.14	5.80	7.44
Norfolk, Va.	6.50	...	...	6.70	...	6.55	7.70	...	6.60	6.50	8.00
Richmond, Va.	5.90	...	8.10	6.10	...	6.10	6.90	...	6.30	6.05	7.80
Wash. (w'hse)	6.02	7.26	8.49	6.46	...	6.46	7.26	...	6.56	6.22	7.86
Buffalo (del.)	5.80	6.60	8.29	6.06	...	5.80	6.65	10.65††§	6.00	6.25	7.55
Buffalo (w'hse)	5.60	6.40	8.09	5.86	...	5.60	6.45	10.45††§	5.80	6.05	7.35
Pitts. (w'hse)	5.60	6.40*	7.75	5.65-5.95	6.90	5.55	6.40	10.10††	5.70	5.75	7.00
Detroit (w'hse)	5.45-5.78	6.53-6.80	7.99	5.94-5.95	7.75	5.84	6.56	8.91	6.09	6.19-6.35	7.28
Cleveland (del.)	5.80	6.60	8.30	5.89	7.10	5.77	6.60-6.70	8.91	10.02	6.12	7.32
Cleve. (w'hse)	5.60	6.40	8.10	5.69	6.90	5.57	6.40-6.50	8.71	5.82	5.92	7.12
Cincin. (city)	6.02	6.59	7.34	5.95	...	5.95	6.51	...	6.24	6.34	7.50
Chicago (city)	5.80	6.60	7.95	5.75	...	5.75	6.50	10.30	5.90	6.00	7.20
Chicago (w'hse)	5.60	6.40	7.75	5.55	...	5.55	6.30	10.10	5.70	5.80	7.00
Milwaukee (city)	5.94	6.74	8.09	5.89	...	5.89	6.74	10.44	6.04	6.14	7.34
Milwau. (c'try)	5.74	6.54	7.89	5.69	...	5.69	6.54	10.24	5.84	5.94	7.14
St. Louis (del.)	6.05	6.85	8.20	6.00	...	6.00	6.85	10.55	6.23	6.33	7.53
St. L. (w'hse)	5.85	6.65	8.00	5.80	...	5.80	6.65	10.35	6.03	6.13	7.33
Kans. City(city)	6.40	7.20	8.40	6.35	...	6.35	7.20	...	6.50	6.60	7.80
KansCity(w'hse)	6.20	7.00	8.20	6.15	...	6.15	7.00	...	6.30	6.40	7.60
Birm'hm (city)	5.75	6.55	6.90‡	5.70	...	5.70	7.53	...	5.85	6.10	8.25
Birm'hm(w'hse)	5.60	6.40	6.75‡	5.55	...	5.55	7.53	...	5.70	5.95	8.23
Los Ang. (city)	6.55	8.10	9.05‡	6.60	8.90	6.55	7.75	...	6.55	6.60	9.20
L. A. (w'hse)	6.35	7.90	8.85‡	6.40	8.70	6.35	7.55	...	6.35	6.40	8.70
San Francisco	6.65	7.80‡	8.90‡	6.60	...	6.45	8.20	...	6.45	6.50	8.60
Seattle-Tacoma	7.05	8.60‡	9.20‡	7.30	...	6.75	9.10	11.15	6.65	6.75	8.80

Prices do not include gage extras; † prices include gage and coating extras, except Birmingham (coating extra excluded) and Los Angeles (gage extra excluded); ‡ includes extra for 10 gage; § as rolled; †† as annealed. Base quantities, 2000 to 9999 lb except as noted: Cold-rolled strip, 2000 lb and over; cold-finished bars, 2000 lb and over; *—500 to 1499 lb; †—450 to 1499 lb; ‡—3500 lb and over; §—1000 to 1999 lb.

ORES

Lake Superior Iron Ore

Gross ton, 51½% (natural), lower lake ports.

After adjustment for analysis, prices will be increased or decreased as the case may be for increases or decreases after Dec. 2, 1950, in applicable lake vessel rates, upper lake rail freights, dock handling charges and taxes thereon.

Old range bessemer	$8.70
Old range nonbessemer	8.55
Mesabi bessemer	8.45
Mesabi nonbessemer	8.30
High phosphorus	8.30

Eastern Local Ore

Cents per unit, del. E. Pa.

Foundry and basic 56-62% concentrates contract	17.00

Foreign Ore

Cents per unit, c.i.f. Atlantic ports

Swedish basic, 60 to 68%:	
Spot	17.00
Long-term contract	15.00
North African hematites	17.00
Brazilian iron ore, 68-69%	24.00-25.00

Tungsten Ore

Net ton unit, duty paid

Foreign wolframite and scheelite, per net ton unit	$65.00
Domestic scheelite, mines	65.00

Manganese Ore

Manganese, 48% nearby, $1.18-$1.22 per long ton unit, c.i.f. U. S. ports, duty for buyer's account; shipments against old contracts for 48% ore are being received from some sources at 79.8-81.8c.

Chrome Ore

Gross ton, f.o.b. cars, New York, Philadelphia, Baltimore, Charleston, S. C., plus ocean freight differential for delivery to Portland, Oreg., or Tacoma, Wash.

Indian and African

48% 2.8:1	$32.50
48% 3:1	35.00-36.00
48% no ratio	26.00

South African Transvaal

44% no ratio	$27.00-28.00
48% no ratio	34.00-35.00

Brazilian

44% 2.5:1 lump	$32.00

Rhodesian

45% no ratio	$20.00-21.00
48% no ratio	26.00
48% 3:1 lump	35.00-36.00

Domestic—rail nearest seller

48% 3:1	$39.00

Molybdenum

Sulphide concentrates per lb, molybdenum content, mines	$1.00

MANGANESE ALLOYS

Spiegeleisen: (19-21% Mn, 1-3% Si). Carlot per gross ton, $75, Palmerton, Pa.; $75, Pittsburgh and Chicago; (16% to 19% Mn) $1 per ton lower.

Standard Ferromanganese: (Mn 78-82%, C 7% approx.) Carload, lump, bulk $185 per gross ton of alloy, c.l. packed, $197; gross ton lots, packed, $212; less gross ton lots, packed, $229; f.o.b. Alloy, W. Va., Niagara Falls, N. Y., Welland, Ont., or Ashtabula, O. Base price: $187, Johnstown, Pa.; $185, Sheridan, Pa.; $188, Etna, Pa.; $190, Chattanooga, Tenn. Shipment from Pacific Coast warehouses by one seller add $33 to above prices, f.o.b. Los Angeles, Oakland, Portland, Oreg. Shipment from Chicago warehouse, ton lots $227; less gross ton lots, $244 f.o.b. Chicago. Add or subtract $2.30 for each 1% or fraction thereof, of contained manganese over 82% and under 78%, respectively.

Low-Carbon Ferromanganese, Regular Grade: (Mn 85-90%). Carload, lump, bulk, max. 0.07% C, 25.75c per lb of contained Mn, carload packed 26.5c, ton lots 27.6c, less ton 28.8c. Delivered. Deduct 0.5c for max. 0.15% C grade from above prices, 1c for max. 0.30% C, 1.5c for max. 0.50% C, and 4.5c for max. 75% C—max. 7% Si. **Special Grade:** (Mn 90% min., C 0.07% max., P 0.06% max.). Add 0.5c to above prices. Spot, add 0.25c.

Medium-Carbon Ferromanganese: (Mn 80-85%, C 1.5% max.). Carload, lump, bulk 19.15c per lb of contained Mn, carload packed 19.9c, ton lot 21.0c, less ton 22.2c. Delivered. Spot, add 0.25c.

Manganese metal, 2" x D (Mn 96% min., Fe 2% max., Si 1% max., C 0.2% max.): Carload, lump, bulk, 34c per lb of metal; packed, 34.75c; ton lot 36.25c; less ton lot 38.25c. Delivered. Spot, add 2c.

Manganese Electrolytic: 40,000 lb or more, 28c; 2000 to 39,999 lb, 30c; 250 to 1999 lb, 32c. Premium for hydrogen-removed metal 1.5c per pound, f.o.b. cars Knoxville, Tenn. Freight allowed to St. Louis or to any point east of Mississippi.

Silicomanganese: (Mn 65-68%). Contract, lump, bulk, 1.50% C grade, 18-20% Si 9.90c per lb of alloy, carload packed, 10.65c, ton lot 11.55c, less ton 12.55c. Freight allowed. For 2% C grade, Si 15-17%, deduct 0.2c from above prices. For 3% C grade, Si 12-14.5%, deduct 0.5c from above prices. Spot, add 0.25c.

TITANIUM ALLOYS

Ferrotitanium, Low-Carbon: (Ti 20-25%, Al 3.5% max., Si 4% max., C 0.10% max.) Contract, ton lot 2" x D, $1.50 per lb of contained Ti; less ton $1.55. (Ti 38-43%, Al 8% max., Si 4% max., C 0.10% max.). Ton lot $1.35, less ton $1.37, f.o.b. Niagara Falls, N. Y., freight allowed to St. Louis. Spot, add 5c.

Ferrotitanium, High-Carbon: (Ti 15-18%, C 6-8%). Contract $177 per net ton, f.o.b. Niagara Falls, N. Y., freight allowed to destinations east of Mississippi river and north of Baltimore and St. Louis.

Ferrotitanium, Medium-Carbon: (Ti 17-21%, C 2-4.5%.) Contract, $195 per ton, f.o.b. Niagara Falls, N. Y., freight not exceeding St. Louis rate allowed.

OTHER FERROALLOYS

Ferrocolumbium: (Cb 56-60%, Si 8% max., C 0.4% max.). Contract, ton lot, 2" x D, $4.90 per lb of contained Cb, less ton $4.95. Delivered. Spot, add 10c.

Ferrotantalum—Columbium: (Cb 40% approx., Ta 20% approx., and Cb and Ta 60% min., C 0.30 max.) ton lots, 2" x D, $3.75 per lb of contained Cb plus Ta, deld.; less ton lots $3.80.

Silicaz Alloy: (Si 35-40%, Ca 9-11%, Al 6-8%, Zr, 3-5%, Ti 9-11%, B 0.55-0.75%). Carload packed, 1" x D, 45c per lb of alloy, ton lot 47c, less ton 49c. Delivered.

SMZ Alloy: (Si 60-65%, Mn 5-7%, Zr 5-7%, Fe 20% approx.). Contract, carload, packed, ⅛" x 12 M, 17.5c per lb of alloy, ton lots 18.25c, less ton 19.5c. Deld. Spot, add 0.25c.

Graphidox No. 4: (Si 48-52%, Ca 5-7%, Ti 9-11%). C.l. packed, 18c per lb of alloy; ton lots 19c; less ton lots 20.50c, f.o.b. Niagara Falls, N. Y.; freight allowed to St. Louis.

V-5 Foundry Alloy: (Cr 38-42%, Si 17-19%, Mn 8-11%). C.l. packed, 15c per lb of alloy; ton lots 16.50c; less ton lots 17.75c, f.o.b., Niagara Falls; freight allowed to St. Louis.

Simanal: (Approx. 20% each Si, Mn, Al; bal. Fe). Lump, carload, bulk 14.50c, packed 15.50c; ton lots, packed, 15.75c; less ton lots, packed, 16.25c per lb of alloy, delivered to destination within United States.

Ferrophosphorus: (23-25% based on 24% P content with unitage of $3 for each 1% of P above or below the base); carloads, f.o.b. sellers' works, Mt. Pleasant, or Siglo, Tenn., $65 per gross ton.

Ferromolybdenum: (55-75%). Per lb, contained Mo, f.o.b. Langeloth, $1.32; Washington, Pa., furnace, any quantity $1.32.

Technical Molybdic-Oxide: Per lb, contained Mo, f.o.b. Langeloth $1.14, packed in bags containing 20 lb of molybdenum; Washington, Pa., $1.13.

NOTE: Current prices on chromium, silicon, vanadium, boron and tungsten alloys appeared on page 163, Sept. 10 issue; calcium, zirconium and briquetted alloys, page 159, Sept. 17. Refractories prices also were published on page 159, Sept. 17 issue.

CEILING PRICES, IRON AND STEEL SCRAP

Prices as set forth in Office of Price Stabilization ceiling price regulation No. 5, as amended Apr. 19, 1951

STEELMAKING SCRAP COMPOSITE

Sept. 20	$44.00
Sept. 13	44.00
July 1951	44.00
Aug. 1950	40.00
Aug. 1946	19.17

Based on No. 1 heavy melting grade at Pittsburgh, Chicago and eastern Pennsylvania.

Basing point ceiling prices per gross ton from which maximum shipping prices are computed on scrap of dealer and industrial origin; and from which ceiling on-line and ceiling delivered prices are computed on scrap of railroad origin.

No. 1 Heavy Melting Steel (Grade 1)

Basing Point	Dealer, Industrial	Railroad
Alabama City, Ala.	$39.00	$41.00
Ashland, Ky.	42.00	44.00
Atlanta, Ga.	39.00	41.00
Bethlehem, Pa.	42.00	44.00
Birmingham, Ala.	39.00	41.00
Brackenridge, Pa.	44.00	46.00
Buffalo, N. Y.	43.00	45.00
Butler, Pa.	44.00	46.00
Canton, O.	44.00	46.00
Chicago, Ill.	42.50	44.50
Cincinnati, O.	43.00	45.00
Claymont, Del.	42.50	44.50
Cleveland, O.	43.00	45.00
Coatesville, Pa.	42.50	44.50
Conshohocken, Pa.	42.50	44.50
Detroit, Mich.	41.15	43.15
Duluth, Minn.	40.00	42.00
Harrisburg, Pa.	42.50	44.50
Houston, Tex.	37.00	39.00
Johnstown, Pa.	44.00	46.00
Kansas City, Mo.	39.50	41.50
Kokomo, Ind.	42.00	44.00
Los Angeles	35.00	37.00
Middletown, O.	43.00	45.00
Midland, Pa.	44.00	46.00
Minnequa, Colo.	38.00	40.00
Monessen, Pa.	44.00	46.00
Phoenixville, Pa.	42.50	44.50
Pittsburg, Calif.	35.00	37.00
Pittsburgh, Pa.	44.00	46.00
Portland, Oreg.	35.00	37.00
Portsmouth, O.	42.00	44.00
St. Louis, Mo.	41.00	43.00
San Francisco	35.00	37.00
Seattle, Wash.	35.00	37.00
Sharon, Pa.	44.00	46.00
Sparrows Point, Md.	42.00	44.00
Steubenville, O.	44.00	46.00
Warren, O.	44.00	46.00
Weirton, W. Va.	44.00	46.00
Youngstown, O.	44.00	46.00

Differentials from Base

Differentials per gross ton for other grades of dealer and industrial scrap:

O-H and Blast Furnace Grades

2. No. 2 Heavy Melting	—$2.00
3. No. 1 Bushelling	Base
4. No. 1 Bundles	Base
5. No. 2 Bundles	— 3.00
6. Machine Shop Turnings	— 10.00
7. Mixed Borings & Short Turnings	— 6.00
8. Shoveling Turnings	— 6.00
9. No. 2 Bushelling	— 4.00
10. Cast Iron Borings	6.00

Elec. Furnace and Fdry. Grades

11. Billet, Bloom & Forge-Crops	— 7.50
12. Bar Crops & Plate	— 5.00
13. Cast Steel	— 5.00
14. Punchings & Plate Scrap	— 2.50
15. Electric Furnace Bundles	— 2.00
Cut Structurals & Plate	
16. 3 feet and under	— 3.00
17. 2 feet and under	— 5.00
18. 1 foot and under	— 6.00
19. Briquetted Cast Iron Borings	Base
Foundry Steel	
20. 2 feet and under	+ 2.00
21. 1 foot and under	+ 4.00
22. Springs and Crankshafts	+ 1.00
23. Alloy Free turnings	+ 3.00
24. Heavy Turnings	+ 1.00

Special Grades

25. Briquetted Turnings	Base
26. No. 1 Chemical Borings	+ 5.00
27. No. 2 Chemical Borings	+ 4.00
28. Wrought Iron	+ 10.00
29. Shafting	+ 10.00

Restrictions on Use

(1) Prices for Grades 11 and 23 may be charged only when shipped to a consumer directly from an industrial producer; otherwise ceiling prices shall not exceed prices established for Grades 12 and 8, respectively.

(2) Prices established for Grades 26 and 27 may be charged only when sold for use for chemical or annealing purposes, and in the case of Grade 27, for briquetting and direct charge into an electric furnace; otherwise ceiling prices shall not exceed price established for Grade 10.

(3) Prices established for Grade 28 may be charged only when sold to a producer of wrought iron; otherwise ceiling price shall not exceed ceiling price for corresponding grade of basic open-hearth.

(4) Premiums for Grades 11-18, 20 and 21 may be charged only when sold for use in electric and open-hearth furnaces or foundries.

(5) Prices for Grade 25 may be charged only when sold for forging or refolling purpose.

Special Pricing Provisions

(1) Sellers of Grades 26 and 27 may make an extra charge of $1.50 per ton for loading in box cars, or 75 cents per ton for covering gondola cars with a weather-resistant covering.

(2) Ceiling price of pit scrap, ladle scrap, salamander scrap, skulls, skimmings or scrap recovered from slag dumps and prepared to charging box size, shall be computed by deducting from the price of No. 1 heavy melting steel of dealer and industrial origin, the following amounts. Where iron content is 55% and over, $6; 75% and over, $10; less than 75%, $12.

(3) Ceiling price of any inferior grade of scrap not listed shall not exceed the price of No. 1 heavy melting steel less $15.

Differentials from Base

Differentials per gross ton above or below the price of Grade 1 (No. 1 railroad heavy melting steel) for other grades of railroad steel scrap:

2. No. 2 Heavy melting Steel	$2.00
3. No. 2 Steel Wheels	Base
4. Hollow Bored Axles and loco. axles with keyways between the wheelseats	Base
5. No. 1 Busheling	— 3.50
6. No. 1 Turnings	— 3.00
7. No. 2 Turnings, Drillings & Borings	—12.00
8. No. 2 Cast Steel and uncut wheelcenters	— 6.00
9. Uncut Frogs, switches	Base
10. Flues, Tubes & Pipes	8.00
11. Structural, Wrought Iron and of steel, uncut	6.00
12. Destroyed Steel Cars	8.00
13. No. 1 Sheet Scrap	9.50
14. Scrap Rails, Random Lengths	+ 2.00
15. Rerolling Rails	+ 7.00
Cut Rails:	
16. 3 feet and under	5.00
17. 2 feet and under	6.00
18. 18 inches and under	8.00
19. Cast Steel, No. 1	3.00
20. Uncut Tires	+ 2.00
21. Cut Tires	5.00
Buggy & Side Frames:	
22. Uncut	Base
23. Cut	3.00
24. Angle, Splice Bars & Tie Plates	5.00
25. Solid Steel Axles	+12.00
26. Steel Wheels, No. 3 oversize	Base
27. Steel Wheels, No. 3	5.00
28. Spring Steel	5.00
29. Couplers & Knuckles	5.00
30. Wrought Iron	8.00
31. Fireboxes	8.00
32. Boilers	6.00
33. No. 2 Sheet Scrap	13.00
34. Carsides, Doors, Car Ends, cut apart	6.00

Restrictions on Use

(1) Price established for Grade 15 may be charged only when purchased and sold for rerolling uses; otherwise, ceiling shall not exceed that for Grade 14.

(2) Price established for Grade 30 may be charged only when sold to a producer of wrought iron; otherwise, ceiling shall not exceed that for No. 1 heavy melting steel.

(3) Price for Grade 25 may be charged only when sold for rerolling and forging purposes; otherwise ceiling shall not exceed that for base grade (No. 1.)

CAST IRON SCRAP

Ceiling price per gross ton for following grades shall be f.o.b. shipping point:

Cast Iron:

1. No. 1 (Cupola)	$49.00
2. No. 2 (Charging Box)	47.00
3. No. 3 (Hvy. Breakable)	45.00
4. No. 4 (Burnt Cast)	41.00
5. Cast Iron Brake Shoes	41.00
6. Stove Plate	46.00
7. Clean Auto Cast	52.00
8. Unstripped Motor Blocks	43.00
9. Wheels, No. 1	47.00
10. Malleable	55.00
11. Drop Broken Machinery	52.00

Restrictions on Use

(1) Ceiling shipping point price which a basic open-hearth consumer may pay for No. 1 cast iron, clean auto cast, malleable or drop broken machinery cast shall be ceiling price for No. 3 cast iron.

(2) Ceiling shipping point price which any foundry other than a malleable iron producer may pay for Grade 10 shall be ceiling price for No. 1 cast iron.

Preparation Charges

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of dealer or industrial origin authorized by OPS are:

(1) For preparing into Grades No. 1, No. 2 or No. 3, $8.

(2) For hydraulically compressing Grade No. 4, $6 per ton; Grade No. 5, $8.

(3) For crushing Grade No. 6, $3.

(4) For preparing into Grade No. 25, $6.

(5) For preparing into Grade No. 19, $6.

(6) For preparing into Grades No. 12, No. 13, No. 14, No. 16, or No. 20, $10.

(7) For preparing into Grade No. 17 or Grade No. 21, $11.

(8) For preparing into Grade No. 18 or Grade No. 20, $12.

(9) For hydraulically compressing Grade No. 15, $8.

(10) For preparing into Grade No. 28, $10.

Ceiling fees per gross ton which may be charged for intransit preparation of any grade of steel scrap of railroad origin shall be:

(1) For preparing into Grade No. 1 and Grade No. 2, $8.

(2) For hydraulically compressing Grade No. 13, $6.

(3) For preparing into Grade No. 16, $4.

(4) For preparing into Grade No. 17, $5.

(5) For preparing into Grade No. 1, $7.

(6) For preparing into Grade No. 21, $4.

(7) For preparing into Grade No. 23, $4.

Ceiling fees per gross ton which may be charged for intransit preparation of cast iron are limited to:

(1) For preparing Grade No. 8 into grade No. 7, $9.

(2) For preparing Grade No. 3 into Grade No. 11, $7.

(3) For preparing Grade No. 3 into Grade No. 1, $4.

Whenever scrap has arrived at its point of delivery and consumer engages a dealer to prepare such scrap, no fee may be charged for such services unless consumer obtains prior written OPS approval.

Commissions

No commission shall be payable to a broker in excess of $1.

Unprepared Scrap

For unprepared scrap, other than materials suitable for hydraulic compression, ceiling basing point prices shall be $8 per ton beneath ceiling of the prepared base grades.

For unprepared material which when compressed constitutes No. 1 bundles, ceiling basing point price shall be $6 per ton beneath ceiling for No. 1 bundles; or when compressed constitutes No. 2 bundles ceiling basing point price shall be $8 beneath ceiling basing point price for No. 2 bundles.

Premiums for Alloy Content

No premium may be charged for alloy content except: $1.25 per ton for each 0.25% of nickel where scrap contains not less than 1% and not over 5.25% nickel; $2 per ton for scrap containing not less than 0.15 per cent molybdenum and $3 for scrap containing not less than 0.65% molybdenum; for scrap containing not less than 10% manganese, $4 for scrap in sizes larger than 12 x 24 x 8 in.; and $14 for scrap cut in that size or smaller (applicable only if scrap is sold for electric furnace uses or on NPA allocation); $1 for scrap conforming to SAE 52100.

Switching Charges

Switching charges to be deducted from basing point prices of dealer, industrial and nonoperating railroad scrap, to determine ceiling shipping point prices for scrap originating in basing points are per gross ton:

Alabama City, Ala., 43c; Ashland, Ky., 47c; Atlanta, 51c; Bethlehem, Pa., 52c; Birmingham, 50c; Brackenridge, Pa., 53c; Buffalo, 53c; Butler, Pa., 65c; Canton, O., 51c; Chicago (including Gary, Ind.), $1.34; Cincinnati (including Newport, Ky.), 63c; Claymont, Del. (including Chester, Pa.), 79c; Cleveland, 76c; Coatesville, Pa., 59c; Conshohocken, Pa., 20c; Detroit, 95c; Duluth, Minn., 50c; Harrisburg, Pa., 51c; Houston, Tex., 57c; Johnstown, Pa., 75c; Kansas City, Mo., 78c; Kokomo, Ind., 51c; Middletown, O., 26c; Midland, Pa., 75c; Minnequa, Colo., 33c; Monessen, Pa., 51c; Phoenixville, Pa., 51c; Pittsburg, Calif., 65c; Pittsburgh (including Bessemer, Homestead, Duquesne, Munhall), 99c; Portland, Oreg., 52c; Portsmouth, O., 51c; St. Louis (including Federal, Granite City, E. St. Louis, Madison, Ill.), 51c; San Francisco (including So. San Francisco, Niles, Oakland), 66c; Seattle, 56c; Sharon, Pa., 75c; Sparrows Point, Md., 20c; Steubenville, O., 51c; Warren, Pa., 75c; Weirton, W. Va., 70c; Youngstown, 75c.

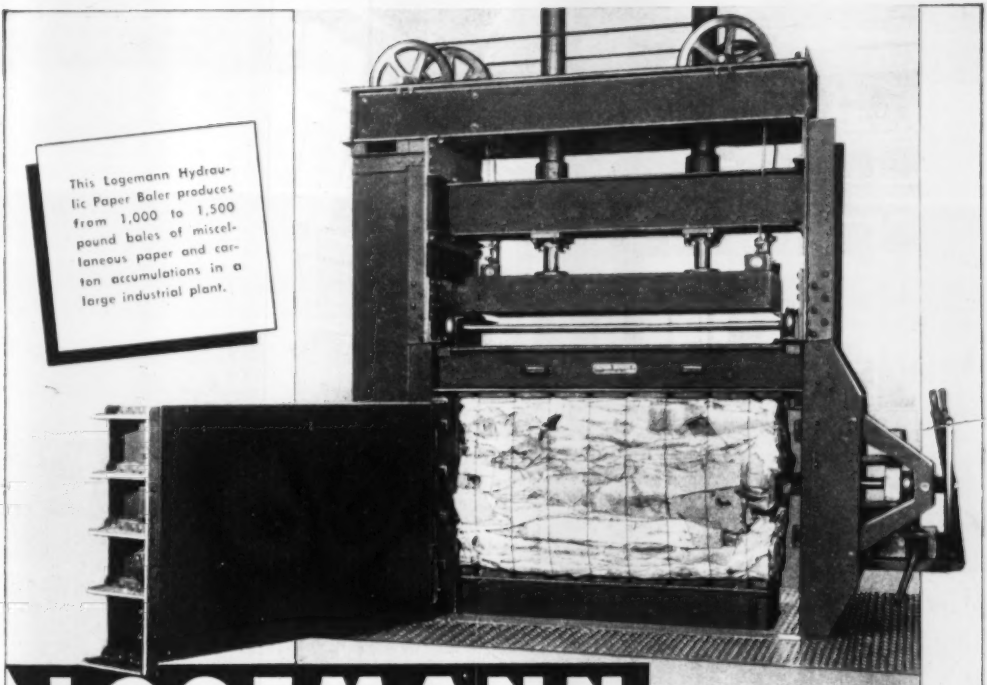
HAMILTON, ONT.

(Delivered Prices)

Heavy Melt	$35.00
No. 1 Bundles	35.00
No. 2 Bundles	34.00
Mechanical Bundles	33.00
Mixed Steel Scrap	31.00
Mixed Borings, Turnings	28.00
Rails, Remelting	35.00
Rails, Rerolling	38.00
Bushelling	29.50
Bushelings new factory, prep'd.	33.00
Bushelings new factory, unprep'd.	28.00
Short Steel Turnings	28.00
Cast Iron Grades*	
No. 1 Machinery Cast	58.00-60.00

* F.o.b. shipping point.

This Logemann Hydraulic Paper Baler produces from 1,000 to 1,500 pound bales of miscellaneous paper and carton accumulations in a large industrial plant.



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Miscellaneous paper and carton balers are obtainable in all sizes from small motor driven units to high speed, extremely powerful, deep box hydraulic balers.

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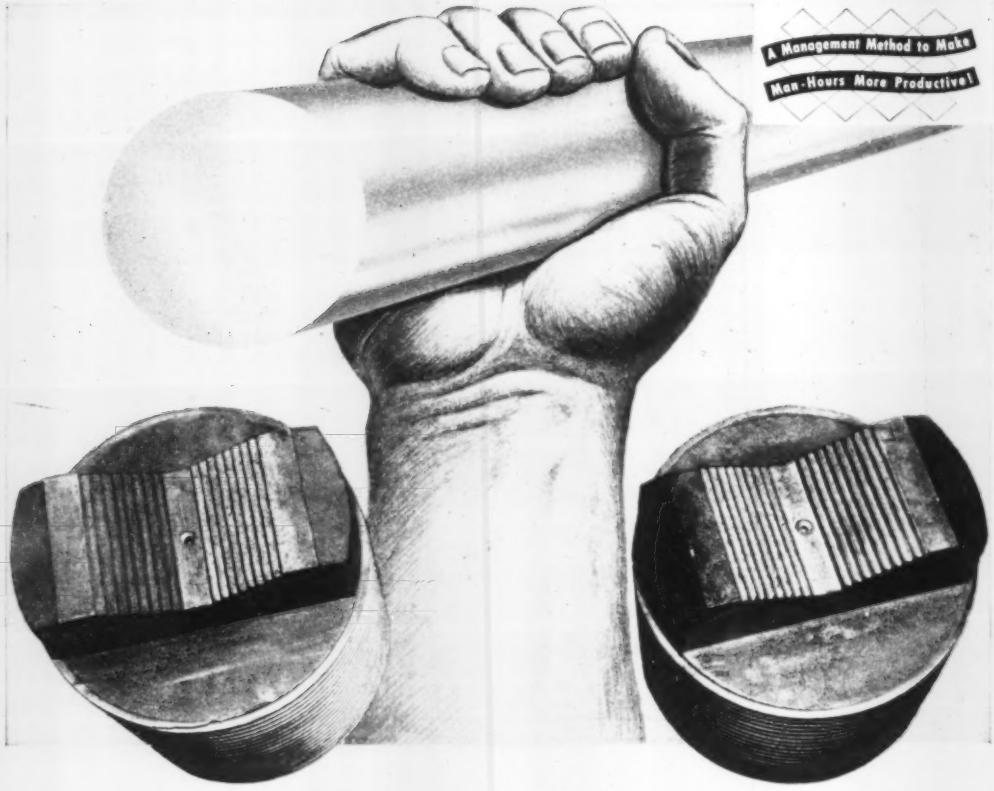

You Can Tighten Your Grip on Production with This Method

These giant jaws, made from Vega (Air-Tough) Tool Steel, grip 15½" round steel billets during rough turning in the largest machine of its type. Steady, uninterrupted production in the operation depended largely on quickly finding the right tool steel.

The company had been using an oil-hardening steel for jaws in normal-sized machines. But when the new giant came along it was a different story. Now a steel was needed that would harden uniformly, and *through very heavy sections*. By using the Carpenter Matched Set Method, the company was right the first time in selecting Vega . . . and saved costly experimenting with different tool steels. More important, production management was able to put the jaws in operation, knowing they could depend upon heavy production schedules being maintained.

This workable Method offers your plant more advantages than accurate, simplified tool steel selection. It can help you make machine operators more productive. It can do a lot to make heat treating a "routine", trouble-free procedure. It can hold your tool steel inventories to a minimum. Find out how, why and where it can work for you. Write for the new booklet "How to Get Better Tool and Die Performance". THE CARPENTER STEEL CO., 139 W. Bern St., Reading, Pa.

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The Metal Market

Position of foreign tin producers in negotiations for new contracts with RFC weakened by development of tinless container by Reynolds Metals Co.

CONFERENCES are scheduled to begin Sept. 24 between officials of Reconstruction Finance Corp. and representatives of the Bolivian government on terms of a long-term contract setting the price which this country will pay for Bolivian tin.

Although our government is still selling Grade A tin to domestic consumers at $1.03 a pound, the RFC has been paying $1.12 a pound for Bolivian metal. Trade reports indicate that representatives of the Bolivian government probably will ask $1.50 a pound at the beginning of the negotiations.

RFC has been buying Bolivian tin on a month-to-month basis since expiration of a contract early in June. Several unsuccessful attempts to negotiate a new contract have been made since then.

Cost Study—Dissatisfaction with the tin price policy of the United States also has been expressed by producers in the Far East. RFC has offered to investigate tin mining conditions in that territory to determine what a fair price for the metal should be. Malayan mining companies asked their federal government to invite American experts to come to Malaya and look into the facts about tin production costs in that country.

"I am willing to send a study group into the mines of any foreign producer," W. Stuart Symington, RFC administrator said, "We're quite willing to pay a fair price for the tin we buy, but we won't make any purchases unless producers keep their profits at a fair level."

The bargaining position of producers is weakened by a development which is expected to reduce sharply our dependence upon tin imports. Mr. Symington recently unveiled a container resembling an ordinary "tin" can but made from three-ply aluminum foil and impregnated with plastics. The new product is a blend of plastics with aluminum foil, developed by Reynolds Metals Co., Richmond, Va. It is made by coating aluminum sheets with plastic and bonding them under heat and pressure.

Production of the new material is starting immediately, but all the present output will go to fill requirements of the armed forces.

This development of a substitute for tin, Mr. Symington said, could be as important as the synthetic rubber program of World War II.

Magnesium Plant Reopened

Formed early this year to reactivate a plant at Manteca, Cal., Kaiser Magnesium Co., subsidiary of Kaiser Aluminum & Chemical Corp., Oakland, Calif., is in full production. Employment has reached 500 persons. The plant's contract is for 20 million pounds of magnesium metal a year—all for the government. Kaiser interests built and operated the Menteca facilities for the federal government during the last war and produced 25 million pounds of the metal over a two year period.

Plans Larger Zinc Output

Production of special high grade zinc will be increased 2000 tons a month as a result of a project being undertaken by American Smelting & Refining Co., New York. The company awarded a contract to Utah Construction Co. for a $3,146,251 addition to its electrolytic zinc plant in Corpus Christi, Tex. The contract covers construction of three buildings, equipment for each and installation.

Present capacity of the plant is 3250 tons of special high grade zinc, 5000 tons of commercial sulphuric acid, 35,000 pounds of refined cadmium, and 150,000 pounds of zinc sulphate.

The company's Federated Metals Division purchased Frictionless Metal Co., St. Louis, producer of bearing metal. Transfer of manufacturing operations to Federated's St. Louis plant has been made and customers are receiving shipments through Federated's distribution channels and from stocks in its plants throughout the country.

Builds Aluminum Smelter

Construction work on Aluminum Co. of America's aluminum smelting plant at Rockdale, Tex., is scheduled to begin within a month.

John D. Harper, who has been assistant district power manager for the company's Tennessee operations, has been named works manager for the Rockdale plant. Len B. Neubert has been appointed construction superintendent for erection of the smelting plant, having been transferred from the company's works at Vancouver, Wash.

It is expected that the metal-producing facilities at Rockdale will be in partial operation late in 1952. When full operation is reached in 1953, production capacity of the plant will be about 170 million pounds annually.

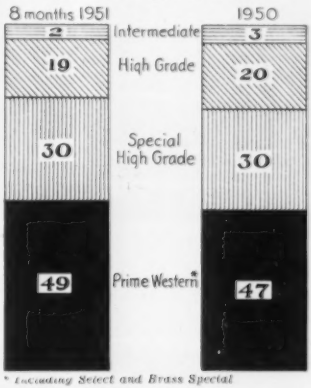
Alumina will be shipped to Rockdale from the company's bauxite refining plant at Mobile, Ala., and from a new plant of similar type now being built in Arkansas. The large quantities of electric power required for the operation of the Rockdale plant will be provided eventually by generating facilities to be erected adjacent to the aluminum plant. The power plant will be operated for Aluminum Co. of America by Texas Power & Light Co. Since aluminum production is scheduled to begin before completion of the power plant, Texas Power & Light will make available from other generating sources the initial quantities of electricity required.

Shipments of aluminum sheet and plate by member companies of the Sheet Division, Aluminum Association, New York, totaled 93,771,078 pounds during July, about 7 per cent over the total shipped in June, says Donald M. White, secretary. Members of the Foil Division shipped 6,918,091 pounds of aluminum foil in July compared with 7,430,852 pounds for June.

July shipments of permanent-mold and sem permanent-mold rough castings, except pistons, by member companies of the Foundry Division totaled 1,816,894 tons compared with 2,363,609 pounds in June.

Classification of Zinc Output by Grades

(In Percentages of Total)



* Including Select and Brass Special

Brass Mills Face Strike

You may have more difficulty in obtaining brass mill products in the fourth quarter than was encountered earlier this year. The industry, hampered by effects of the recent strike at mines and smelters, now faces a threat of a shutdown of its own plants. Negotiations are under way between officials of the union and representatives of Connecticut mills to avert a strike, scheduled for Sept. 24.

A strike of Chilean dockworkers, in effect since Aug. 29, has ended. Substantial tonnages on Chilean docks will start moving soon to this country. American consumers are getting 80 per cent of the total Chilean production at 27.50c a pound, New York.

Consumers of brass mill products may have to pay higher prices later in the year. This is based on the fact that the government may permit an upward revision in lead and zinc quotations, a component of some brass grades.

NONFERROUS METALS

(Cents per pound, carlots, except as otherwise noted)

Primary Metals

Copper: Electrolytic, 24.50c, Conn. Valley; Lake 24.62½c, delivered.

Brass Ingots: 80-5-5-5, (No. 115), 27.25c; 88-10-2 (No. 215), 38.50c; 85-5-10-5 (No. 305), 32.25c; No. 1 yellow (No. 405), 24.25c.

Zinc: Prime western, 17.50c; brass, special 17.75c; intermediate 18.00c; East St. Louis, high grade 18.85c, delivered.

Lead: Common 16.80c; chemical 16.90c; corroding 16.90c; St. Louis.

Primary Aluminum: 99% plus, ingots 19.00c; pigs 18.00c. Base prices for 10,000 lb and over. Freight allowed on 500 lb or more but not in excess of rate applicable on 30,000 lb, c.l. orders.

Secondary Aluminum: Piston alloys 20.50c; No. 12 foundry alloy (No. 2 grade) 19.50c; steel deoxidizing grades, notch bars granulated or shot: Grade 1, 1-in. 19.00c; grade 2, 17.50c; grade 3, 17.25c; grade 4, 16.50c.

Magnesium: Commercially pure (99.8%) standard ingot, 10,000 lb and over 24.50c, f.o.b. Freeport, Tex.

Tin: Grade A, prompt 103.00.

Antimony: American 99.99%, and over but not meeting specifications below 42.00c; 99.8% and over (arsenic 0.05% max.; other impurities 0.1% max.) 42.50c, f.o.b. Laredo, Tex., for bulk shipments.

Nickel: Electrolytic cathodes, 99.9%, base sizes at refinery, unpacked, 56.50c; 25-lb pigs, 59.15c; "XX" nickel shot, 60.15c; "F" nickel shot or ingots, for addition to cast iron, 56.50c. Prices include import duty.

Mercury: Open market, spot, New York, $202-$208 per 76-lb flask.

Beryllium-Copper: 3.75-4.25% Be, $1.56 per lb of alloy, f.o.b. Reading, Pa.

Cadmium: Regular straight or flat forms, $2.55 del.; special or patented shapes $2.80.

Cobalt: 97.99%, $2.10 per lb for 500 lb (keg); $2.12 per lb for 100 lb (case); $2.17 per lb under 100 lb.

Gold: U. S. Treasury, $35 per ounce.

Silver: Open market, New York 90.16c per oz.

Platinum: $90-$93 per ounce from refineries.

Palladium: $24 per troy ounce.

Iridium: $200 per troy ounce.

Titanium (sponge form): $5 per pound.

Rolled, Drawn, Extruded Products

COPPER AND BRASS

(Ceiling prices, cents per pound, f.o.b. mill, effective Aug. 25, 1951)

Sheet: Copper 41.68; yellow brass 38.28; commercial bronze, 95%, 41.61; 90%, 41.13; red brass, 85%, 40.10; 80%, 39.67; best quality, 39.15; nickel silver, 18%, 53.14; phosphor-bronze grade A, 5%, 61.07.

Rod: Copper, hot-rolled 37.52; cold-drawn 38.78; yellow brass free cutting, 32.63; commercial bronze, 95%, 41.20; 90%, 40.82; red brass 85%, 39.83; 80%, 39.36.

Seamless Tubing: Copper 41.72; yellow brass 41.29; commercial bronze, 90%, 43.79; red brass, 85%, 43.65.

Wire: Yellow brass 38.57; commercial bronze, 95%, 41.90; 90%, 41.42; red brass, 85%, 40.43; 80%, 39.96; best quality brass 39.44.

(Base prices, effective Nov. 6, 1950)

Copper Wire: Bare, soft, f.o.b. eastern mills, c.l., 28.67-30.42; l.c.l., 29.17-30.92; 100,000 lb lots 28.545-30.295; weatherproof, f.o.b. eastern mills, c.l., 29.50-30.00; l.c.l., 30.00-31.10; 100,000 lb lots 29.35-30.35; magnet, del., 15,000 lb or more 34.50c, l.c.l. 35.25.

ALUMINUM

(20,000 lb base; freight allowed on 500 lb or more, but not in excess of rate applicable on 30,000 lb c.l. orders)

Sheets and Circles: 28 and 38 mill finish, c.l.

Thickness Range Inches	Widths or Diameters, In.	Flat Sheet Base*	Coiled Sheet Base	Coiled Circle† Base
0.249-0.136	12-48	30.1	....	32
0.135-0.096	12-48	30.6	....	....
0.095-0.077	12-48	31.2	29.1	33.2
0.076-0.061	12-48	31.8	29.5	33.4
0.060-0.048	12-48	32.1	29.5	33.7
0.047-0.038	12-48	32.5	29.8	34.0
0.037-0.030	12-48	32.8	30.2	34.6
0.029-0.024	12-48	33.4	30.5	35.0
0.023-0.019	12-36	34.0	31.1	35.7
0.018-0.017	12-36	34.7	31.7	36.6
0.016-0.015	12-36	35.5	32.4	37.6
0.014	12-24	36.5	33.3	38.9
0.013-0.012	12-24	37.4	34.0	39.7
0.011	12-24	38.4	35.0	41.2
0.010-0.0095	12-24	39.4	36.1	42.7
0.009-0.0085	12-24	40.6	37.2	44.4
0.008-0.0075	12-24	41.9	38.4	46.1
0.007	12-18	43.3	39.7	48.2
0.006	12-18	44.8	41.0	52.8

* Lengths 72 to 120 inches. Maximum diameter, 26 inches.

Screw Machine Stock: 5000 lb and over.

Dia. (in.) or distance across flats	Round R317-T4 178-T1	R317-T4	Hexagonal 178-T4
0.125	42.0	....	....
0.156-0.218	41.0	....	....
0.219-0.313	41.5	....	....
0.375	40.0	46.0	48.0
0.406	40.0	....	....
0.438	40.0	46.0	48.0
0.469	40.0	....	....
0.500	40.0	46.0	48.0
0.531	40.0	....	....
0.563	40.0	....	45.0
0.594	40.0	....	....
0.625	40.0	43.5	45.0
0.688	40.0	....	45.0
0.750-1.000	39.0	41.0	42.5
1.063	38.0	....	41.0
1.125-1.500	37.5	39.5	41.0
1.563	37.0	....	....
1.625	36.5	....	39.5
1.688-2.000	36.5	....	....

LEAD

(Prices to jobbers, f.o.b. Buffalo, Cleveland, Pittsburgh). Sheets: Full rolls, 110 sq ft or more $22.00 per cwt; add 50c cwt 10 sq ft to 110 sq ft. Pipe: Full coils $22.00 per cwt. Traps and bends: List prices plus 60%.

ZINC

Sheets, 24.50c, f.o.b. mill 36,000 lb and over. Ribbon zinc in coils 23.00c, f.o.b. mill, 36,000 lb and over. Plates, not over 12-in., 23.50-24.50c; over 12-in. 25.50-24.50c.

"A" NICKEL

(Base prices, f.o.b. mills)

Sheets, cold-rolled, 77.00c. Strip, cold-rolled 83.00c. Rods and shapes, 73.00c. Plates, 75.00c. Seamless tubes, 106.00c.

MONEL

(Base prices, f.o.b. mills)

Sheets, cold-rolled, 60.50c. Strip, cold-rolled 63.50c. Rods and shapes, 58.50c. Plates, 59.50c. Seamless tubes, 93.50c. Shot and blocks, 53.50c.

MAGNESIUM

Extruded Rounds, 12 in. long, 1.31 in. in diameter, less than 25 lb, 55.00-62.00c; 25 to 99 lb, 45.00-52.00c; 100 lb to 5000 lb, 41.00c.

TITANIUM

(Prices per lb, 10,000 lb and over, f.o.b. mill) Sheets, $15; sheared mill plate, $12; strip, $15; wire, $10; forgings, $6; hot-rolled and forged bars, $6.

DAILY PRICE RECORD

1951	Copper	Lead	Zinc	Tin	Aluminum	Antimony	Nickel	Silver
Sept. 1-20	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. 1-31	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
Aug. Avg.	24.50	16.80	17.50	103.00	19.00	42.00	56.50	90.16
July Avg.	24.50	16.80	17.50	106.00	19.00	42.00	56.50	90.16
June Avg.	24.50	16.80	17.50	117.062	19.00	42.00	56.50	88.492
May Avg.	24.50	16.80	17.50	139.923	19.00	42.00	56.50	90.16
Apr. Avg.	24.50	16.80	17.50	145.735	19.00	42.00	56.50	90.16
Mar. Avg.	24.50	16.80	17.50	145.730	19.00	42.00	56.50	90.16
Feb. Avg.	24.50	16.80	17.50	182.716	19.00	42.00	56.50	90.16
Jan. Avg.	24.50	16.80	17.50	171.795	19.00	55.462	56.50	88.850

NOTE: Copper: Electrolytic, del. Conn. Valley; Lead, common grade, del. St. Louis; Zinc, prime western, E. St. Louis; Tin, Straits, del. New York. Aluminum primary ingots, 99%, del. Antimony, bulk, f.o.b. Laredo, Tex.; Nickel, electrolytic cathodes, 99.9%, base sizes at refinery unpacked. Silver, open market, New York. Prices, cents per pound, except silver, cents per ounce.

Plating Materials

Chromic Acid: 99.9%, flakes, f.o.b. Philadelphia, carloads, 27.00c; 5 tons and over 27.50c; 1 to 5 tons, 28.00c; less than 1 ton 28.50c.

Copper Anodes: Base 2000 to 5000 lb, f.o.b. shipping point, freight allowed: Flat, rolled, 38.34c; oval 37.84c.

Nickel Anodes: Rolled oval, carbonized, carloads, 74.50c; 10,000 to 50,000 lb, 75.00c; 5000 to 10,000 lb, 76.00c; 500 to 5000 lb, 77.50c; 100 to 500 lb, 79.50c; under 100 lb, 82.50c; f.o.b. Cleveland.

Nickel Chloride: 36.50c in 100 lb bags; 34.50c in lots of 400 lb through 10,000 lb; 34.00c over 10,000 lb, f.o.b. Cleveland, freight allowed on 400 lb or more.

Sodium Stannate: 25 lb cans only, less than 100 lb, to consumers, 77.7c; 100 or 350 lb drums only, 100 to 600 lb, 63.1c; 700 to 1900 lb, 60.6c; 2000 to 9000 lb, 58.9c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Tin Anodes: Bar, 1000 lb and over $1.19; 500 to 999 lb, $1.195; 200 to 499 lb, $1.20; less than 200 lb, $1.215. Freight allowed east of Mississippi and north of Ohio and Potomac.

Zinc Cyanide: 100 lb drums, less than 10 drums 47.7c; 10 or more drums, 45.7c, f.o.b. Niagara Falls, N. Y.

Stannous Sulphate: 100 lb kegs or 400 lb bbl, less than 2000 lb $1.0099, more than 2000 lb, 98.99c. Freight allowed east of Mississippi and north of Ohio and Potomac rivers.

Stannous Chloride (Anhydrous): In 400 lb bbl, $7.23; 100 lb kegs $8.25c. Freight allowed.

Scrap Metals

Brass Mill Allowances

Ceiling prices in cents per pound for less than 20,000 lb, f.o.b. shipping point, effective June 26, 1951.

	Clean Heavy	Rod Ends	Clean Turnings
Copper	21.50	21.50	20.75
Yellow Brass	19.125	18.875	17.875
Commercial Bronze			
95%	20.50	20.25	19.75
90%	20.50	20.25	19.75
Red Brass			
85%	20.25	20.00	19.625
80%	20.125	19.875	19.375
Muntz metal	18.125	17.875	17.375
Nickel silver, 10%	21.50	21.25	19.75
Phos. bronze, 5%	25.25	25.00	24.00

Copper Scrap Ceiling Prices

(Base prices, cents per pound, less than 40,000 lb f.o.b. point of shipment)

Group 1: No. 1 copper 19.25; No. 2 copper wire and mixed heavy 17.75; light copper 16.50. No. 1 borings 19.25; No. 2 borings 17.50; refinery brass 17.00 per lb of dry Cu content for 50 to 60 per cent material and 17.25 per lb for over 60 per cent material.

Group II: No. 1 soft red brass solids 19.50; No. 1 composition borings 19.25 per lb of Cu content plus 85 cents per lb of Sn content; mixed red brass borings 17.25 per pound or Cu content plus 78 cents per lb of tin content; unlined red car boxes 19.25; lined red car boxes 18.25; cocks and faucets 16.75; mixed brass screens 16.00; zinc bronze solids and borings 16.25.

Zinc Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment)

Unsweated zinc dross 12.25c; new clippings and trimmings 14.50c; engravers' and lithographers' plates 14.50c; die cast slabs, min. 90% zinc 12.25c; old zinc scrap 11.25c; forming and stamping dies 11.25c; new die cast scrap 10.75c; old die cast radiator grills, 10.50c; old die cast scrap, 9.50c.

Lead Scrap Ceiling Prices

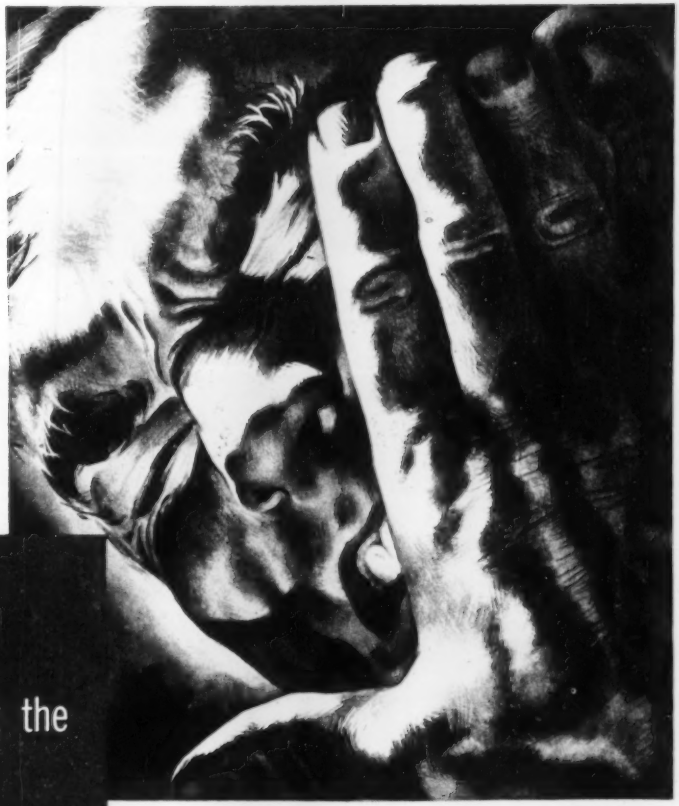
(F.o.b. point of shipment)

Battery lead plates 17.00c per lb of lead and antimony content less smelting charge of 2 cents per lb of material in lots 15,000 lb or more, less 2.25c in lots less than 15,000 lb. Used storage batteries (in boxes) drained of liquid, 6.60c for 15,000 lb or more, 6.40c for less than 15,000 lb. Soft lead scrap, hard lead scrap, battery slugs, cable lead scrap or lead content of lead-covered cable 13.25c per lb. In addition, brokerage commissions are permitted.

Aluminum Scrap Ceiling Prices

(Cents per pound, f.o.b. point of shipment, less than 5000 lb)

Segregated plant scrap: 28 solids, copper free, 10.50; high grade borings and turnings, 8.50; No. 12 piston borings and turnings, 7.50. Mixed plant scrap: Copper-free solids, 10.00 dural type, 9.00; obsolete scrap: Pure old cable 10.00, sheet and sheet utensils, 7.25, old castings and forgings, 7.75, clean pistons, free of struts, 7.75; pistons with struts, 5.75.



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Eye Accidents Cost $160,000,000 in LOST MAN HOURS*

In these days of accelerated production, what to do about other high costs may be debatable, but the wisdom of preventing eye accidents and their high costs is clearly apparent by simple arithmetic. A goggle representing an investment of about $2.30 can prevent a four figure claim . . . keep an experienced man on the job instead of a novice . . . protect the valuable machine he works on (as well as the man) . . . keep volume up and rejects down. Add the direct savings in medical care, first aid, and the indirect benefits of improved morale, and the case for an AO Eye Protection Program is overwhelming — particularly when the program can pay for itself in less than 6 months time! Ask your nearest AO Safety Representative for complete details.

*ESTIMATE. Does not include average cost of compensation which even for the low cost year of 1938 was $328.00.

American Optical Company
SAFETY PRODUCTS DIVISION

SOUTHBRIDGE, MASSACHUSETTS • BRANCHES IN PRINCIPAL CITIES

Sheets, Strip . . .

Sheet and Strip Prices, Page 145 & 146

Chicago — Despite curtailment in home appliance and auto use, demand for cold-rolled sheets and strip is undiminished. Pressure for this grade is as strong as ever with production short of requirements. Tight supply in galvanized sheets, due to zinc shortage, shows little sign of improvement. One producer is a month behind schedule on its galvanized product commitments. This sheetmaker has opened books on all products through third quarter of 1952, acceptances being based on CMP preliminary quotas. Another district producer has not opened books for first quarter, intimating it likely will hold acceptance to the first month of the period when it does act.

Boston—With most old free-tonnage orders cancelled out, buying of narrow cold-rolled strip is more orderly under controlled distribution. Pressure for deliveries is easier, notably for shoe shank steel. Consumers' inventories are in better balance. Consumption of flat-rolled steel for durable consumer goods is well below peak established earlier in the year, especially for ranges.

New York—Some sheet producers believe activity in the gray market will spurt in the fourth quarter on the theory that a number of small buyers, who were able to place tonnage on a first-come first-served basis for that period, will have bought more than they can use and will try to dispose of some of it at a profit. On the other hand some reason that these same buyers will encounter difficulty getting tonnage for the first quarter.

Philadelphia—Sheet producers are booked up solidly for fourth quarter on the straight chrome grades. Until recently these were the only grades that could still be handled before the close of the year, barring scattered cancellations.

Pittsburgh—Sheet producers are booked into first quarter 1952, but demand is slower. Purchasers are less excitable than earlier in the year, although required tonnages are the same. Some reductions and a few cancellations involving small tonnages have been received, but this only serves to reduce the carryover. Zinc shortage has forced cutbacks in galvanizing operations. Clad sheet producers are faced with difficulty in obtaining supplies and partial curtailment of operations is a distinct possibility.

Cleveland—Sheetmakers are booked solidly through fourth quarter. Some CMP tickets that are now coming through for the period are being turned away since predicted cancellations of duplicate tonnage have not come to the mills in substantial volume to make way for any added burden in mill schedules. Books have been opened for first quarter tonnage on regular account, and only orders on military account are being accepted beyond. Galvanized sheets are in tightest supply in the flat-rolled category.

Detroit—Production of cold-rolled sheets was resumed last week by Ford Motor Co., after a five-week interruption of tandem-mill operation while construction work was in progress on a new battery of coke ovens.

Cincinnati—Ordering of sheets for first quarter delivery gives no indication of any tapering in demand, even those makers of consumer goods who are facing cutbacks being in the market for all tonnage allotted.

Los Angeles—Addition of the eighth open-hearth furnace has given Kaiser Steel Corp.'s Fontana mill sufficient semifinished steel to produce 13 gage hot-rolled sheet for the first time on its new 86-inch mill.

Tubular Goods . . .

Tubular Goods Prices, Page 149

Los Angeles—To receive more oil country tubular goods, complaining California oil well drillers were advised by Petroleum Administration for Defense to submit applications for steel fitted to a three-year period in which oil well drilling activity was higher instead of the 1950 period—a year of lessened activity.

San Francisco—Residential pipe is one item that is emerging from the critical stage, a direct result of a decline in home building.

Seattle—Cast iron pipe market is quiet. No important projects are up for early action. Considerable government work is under way, but in many projects other types of pipe have been purchased, due to delivery or other conditions.

Steel Bars . . .

Bar Prices, Page 145

Philadelphia—Carbon bars are becoming one of the most difficult items to obtain, being now almost in a class with plates and shapes in this respect. Producers will go into fourth quarter with a substantial carryover of rated work and some see no way of getting caught up by even the end of the year. One large producer is taking nothing but top priority work for first quarter until he has a better idea as to where he stands. Under present circumstances consumers who have until Sept. 24 to convert unrated tonnage to CMP stand little chance of obtaining tonnage for some time not only in bars but in other major products. Mills are overbooked on rated work and so far have received few cancelations.

New York—Some hot bar sellers haven't opened books for first quarter, although a majority have and are limiting acceptances to no later than this period. The only exceptions are highly rated orders and special government directives. Some sellers who haven't opened books for first quarter claim their schedules are so snarled up for fourth quarter that they don't feel like going ahead for the next period until the situation clarifies. On alloy bars, which require special treatment, producers generally are accepting tonnage for shipment beyond the end of this year.

Boston—Demand for carbon and alloy bars, especially cold-finished, is unabated. Producers are booked through the balance of this year with some tonnage tickets unplaced. Forge shops are buying heavily since their order backlogs are mounting as defense requirements increase. Bolt and nut producers, as well as practically all other bar consumers, are active with tonnage requirements high.

Pittsburgh—Most producers' books are not open to general CMP orders, although important defense orders are taken as received. This is due to reluctance on producers' part pending government rulings clearly defining action necessary in first quarter. Fourth quarter is over-booked, reductions and cancellations not developing as expected. With possible shaving of fourth quarter orders to eliminate yearend carryover and anticipated lower ingot production for first quarter, bar makers expect their operations to be seriously curtailed.

Chicago—Some books are open for first quarter orders on bars, as well as other steel products; one large interest intimates it will accept orders only for the first month of the period when it formally opens its books. Pressure for tonnage is unabated. Elimination of the first-come first-served basis for booking orders under CMP makes possible restoration of more normal mill-customer relationships, but it is under attack from some classes of consumers. Washington control authorities are being pressed to rescind the amendment.

Plates . . .

Plate Prices, Page 145

Boston—Operations at some weldment shops will suffer beginning next month unless fourth quarter allotments to them are increased. Amount of plates allocated in some instances is barely one-fourth the tonnage required for schedules tentatively planned. Order backlogs held by weldment shops, ranging up to six months, consist largely of highly-rated needs and include those for machine tools and rolling mill equipment. Confusion also prevails as to classification of weldments and heads, some being classed as "B" products under CMP and others as "A" products, depending upon end use; if the former, heads are included in plate quotas.

New York — Despite assurances from Washington that fourth quarter cancellations will involve a fairly substantial tonnage, due to a cut in final allotments, little tonnage has been blarked out to date for this reason. Such work as may be canceled for fourth quarter from now on should have little bearing on November as the lead time for that month has expired. Except for one or two large sellers, plate makers are accepting tonnage for first quarter on a selective basis; they are booking nothing beyond except on high rated tonnage.

Philadelphia—With the lead time for November having expired, plate producers say there is not a ghost of a chance of new orders being accepted for rolling in the first two months of the final quarter except in cases of cancellations which to date have been almost negligible. There is not much more chance of new tonnage being entered for rolling in the third month, as the mills are booked to overflowing for that period as well. However, schedules are not definitely frozen, and should something of prime importance arise it could be entered at the expense of tonnage already accepted.

Pittsburgh — Although plate inquiries are received for deliveries well into 1952, most producers are reluctant to accept unless order carries

important direct defense rating. Mills prefer reasonably short-range commitments since under constantly changing CMP too much can happen to alter long-range commitments. Some fabricators are being warned that fourth quarter ordered tonnage may be shaved slightly by producers who are attempting to rid themselves of carryover by the yearend.

San Francisco—Demand for plates continues unabated and new supplies are not keeping up with consumption.

Seattle — Several classified Army jobs in Washington and Montana involve unstated tonnages of plates for fuel storage facilities.

Reinforcing Bars . . .

Reinforcing Bar Prices, Page 145

San Francisco — A lessening in building activity has relieved the pressure for reinforcing bars somewhat, but supply continues limited, reflecting in part heavy shipments to the Pacific Islands and Alaska.

Seattle — Rolling mill operations continue at peak, primary effort being to speed deliveries. Management is more interested in 1952 contracts than business for prompt execution. There is no decline in demand for reinforcing. Backlogs continue above normal.

Structural Shapes . . .

Structural Shape Prices, Page 145

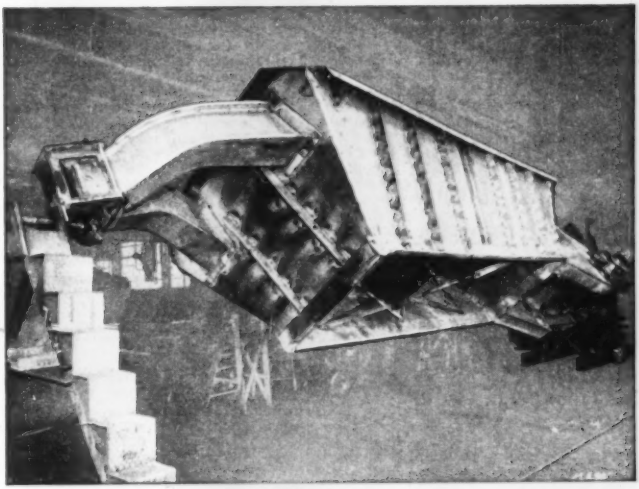
New York—Apart from a limited amount of public work, little structural tonnage is being placed. Builders generally are holding off until the situation clarifies with respect to the availability of construction materials. Present demand is the lightest in several years. Some fabricators expect a sharp curtailment in operating rates late in the fourth quarter unless there is some easing in supply of plates and bars as well as shapes.

Boston—Redesign of several steel frame projects to reinforced concrete construction is made necessary by the structural steel shortage and reduction in allocations. A substantial tonnage of bridge work will be extended beyond original completion schedules.

Philadelphia—Bridge work dominates an otherwise dull structural market, reflection of which is seen in the light volume of orders being received by small and medium sized shops which, in general, do not figure on this type of work.

Pittsburgh—Pittsburgh Parking Authority was granted an allotment of 320 tons of structurals for construction of two parking garages. Allotment covers fourth quarter only and the required 2500 tons for completion of the garages is hoped for in ensuing quarterly periods. Many other public construction projects have been delayed due to structural shortage. Trade executives try to reconcile government requests for rapid expansion with recent cuts in steel allotments for industrial expansion.

Chicago—Structurals are in tightest position of all the major steel products from the standpoint of pressure for shipments. This results from the crowding forward of deliveries on critical account. Actually, plates are in tighter supply than structurals when viewed from the normal mar-



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keting position of the two products. Currently there is considerable speculation as to how severely the steel expansion program will be hit by the curtailment in structural allotments for this work. Fourth quarter expansion calls for 174,000 tons of structurals, but only 89,000 tons, or 51 per cent, have been allocated.

Seattle—Fabricators are heavily booked for the next six months. Scarcity of steel is a serious handicap, restricting bidding to available materials.

William A. Bugge, state highway director, Olympia, Wash., says shortage of steel threatens indefinite postponement of a number of important bridge projects. Modernization of Highway 99 involves 51 bridges of various sizes, steel for which will not be available for several years.

Wire . . .

Wire Prices, Page 147

Chicago—All classes of wire consumers are pressing mills for shipments. No easing in supply is expected until well into first half of next year at the earliest; any change in supply depends upon the military program developments. The allocation of tonnage to warehouses for flood rehabilitation work in the Kansas-Missouri area has been extended.

San Francisco—Wire products and nails are loosening up at the consumer level, another result of tapering building activity.

Boston—Pressure has eased on some wire products. In a few instances, orders are slower as buyers approach the limit allowed under inventory regulations. Orders for heading wire are maintained with fourth quarter allotments only slightly below those for the third quarter. Demand for precision spring wire for defense is heavy, notably for fuses, although procurement by aircraft producers lags behind expectations.

Iron Ore . . .

Iron Ore Prices, Page 151

Buffalo—Industrialists here anticipate the need for an early opening of the 1952 lake shipping season to avoid any interruption to the high rate of operations. Waterfront Associates Inc. (Edward P. Jackson, secretary) is urging the federal government to assign an ice breaker to the Port of Buffalo to assure its winter grain storage fleet of an early spring sailing. It was pointed out that this fleet may total as many as 100 or more ships, including some ore carriers. The loss due to spring ice conditions in the outer harbor is historically a period of from 15 to 30 days navigating time per vessel.

Cleveland—In sharp contrast with the ominous outlook for winter scrap supplies, large stock of iron ore is being accumulated and already amounts to more than five months' needs at present rate of consumption.

Total stocks of Lake Superior iron ore on Sept. 1 amounted to 39,919,980 tons, increase of nearly 10 million tons over the amount reported a year ago.

With only 6 blast furnaces idle out of a total of 184 in the United States and with only 1 idle out of 11 in Canada (including a new furnace placed in operation by Dominion Foundries & Steel Ltd., Hamilton, Ont.,) consumption of Lake Superior iron ore increased to 7,698,684 tons in August from 7,555,898 tons in July and 7,371,365 tons in August, 1950.

Lake Superior iron ore shipments increased to 3,045,154 tons for the week ended Sept. 17 from 2,864,038 tons for the preceding week and 2,814,802 tons for the like week a year ago. Cumulative total for the season is 65,760,980 tons compared with 53,370,119 tons for the like 1950 period.

Steep Rock Lake, Ont.—Shipments of iron ore from Steep Rock Iron Mines Ltd. passed the 1 million ton mark for the season on Sept. 13 compared with 750,000 tons for the same period a year ago. The company, largest iron ore producer in Canada, is preparing a second open pit plus an underground mine for early production. At the present rate, Steep Rock's total 1951 shipments down the Great Lakes will exceed substantially last year's total of 1,216,614 tons.

Pig Iron . . .

Pig Iron Prices, Page 144

Chicago—Pressure for foundry pig iron is slightly easier because some shops have accumulated more than the 30-day's supply allowed under government regulations. Pig iron demand is just as heavy as ever, slackening of requests from some shops permitting sellers to more satisfactory care for requirements of those foundries in short inventory position. Contraction in civilian goods production is reflected in a slackening of operations at some shops, but military and essential defense work likely will take up this slack soon. Only two blast furnaces are idle in the district. One large steelmaker, who sells about 5000 tons of iron monthly in the merchant market, plans to take off one stack late this year. Hence, resulting tightening in merchant iron supply is anticipated just at a time when defense needs of the foundries are expected to be rising.

Boston—Overall pig iron melt has not snapped back to presummer levels and some jobbing shops have smaller order backlogs. An exception to the trend is increased castings production for the machine tool industry, bulk of industrial expansion being in that field. Foundries' inventories of iron are at the top of regulation limits in more instances and pressure for deliveries has eased, except in a few instances where shops have direct defense contracts.

New York—Pig iron supply continues stringent. Most foundries have not had to curtail current operations because of lack of pig iron, but some have far less than their 30 day supply permitted by the government.

Buffalo—Tension mounts over limited supplies of merchant pig iron. The pinch caused by shutdown of a top tonnage merchant iron stack is being felt and shipments are being spread thinner among commercial jobbers.

Philadelphia—Some foundries which

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have been fairly good buyers of imported iron are offering some of their tonnage for resale so as to bring their inventories down to a point where they will at least be permitted to order domestic iron if they can get it.

Pittsburgh—Peak iron production continues with 53 of district's 54 stacks in operation. Jones & Laughlin Steel Corp. announced the greatest pig iron tonnage produced in its history for August. Foundry activity is more than seasonally normal, placing additional pressure on suppliers.

Cleveland—Merchant iron suppliers are distributing available tonnage among foundries in such fashion no shops have been forced to curtail for lack of supply. Overall tonnage is limited and expectations are supply will become even more stringent as foundry operations expand in step with rising defense demands. The fact that one blast furnace here that ordinarily serves the merchant trade in this district is down for repairs is a cause for concern.

Cincinnati—Foundry backlogs for civilian needs are smaller, reflected in diminished pressure for pig iron. Requirements for machine tools are up. Foreign iron is disappearing as a factor in district supply.

Los Angeles—Kaiser Steel Corp.'s two blast furnaces at Fontana produced record pig iron tonnage in August, 11 per cent above estimated capacity and using 30 per cent less coke than national average of 1900 pounds of coke per ton of iron.

Scrap . . .

Scrap Prices, Page 152

Pittsburgh—Foundry scrap grades are in good supply; some dealers believe as much as 20 per cent could be diverted to steel plants without effect upon foundries' operations. Too much light scrap is the major complaint of steelmakers. Greater production could be achieved if light scrap ratio could be reduced. Light scrap takes longer charging times and lengthens time between heats as well as requiring additional care in the melting operation. Inventories are generally lower than ten days' supply and many shops rely on daily shipments to maintain operations.

Youngstown—Unless more scrap starts moving in pretty soon, Youngstown steel plants probably will be unable to keep up their record breaking production next winter. In fact, some open hearths may be forced to shut down for lack of it. Local plants use several million tons of purchased scrap yearly. Currently, scrap supplies are down to 10 days' to two weeks' needs.

Detroit—Dealer allocation of steel mill scrap is more prevalent. Mills look to the scrap drive as their best hope for building inventories substantially. Several industries, including local utilities and railroads, report concrete results from their drives to clean out obsolete machinery, tracks and the like. Automakers have collected 33,000 tons of dormant scrap since the drive began.

Buffalo—Better sentiment prevails in the scrap market as dealers resume shipments to local mills after being forced, under allocation orders, to complete three-weeks shipments to two consumers in the Valley. Mills here have about a five-week reserve supply.

Cleveland—Movement of scrap has failed to increase this month over the slow August rate as had been expected by the trade. As a result, seriousness of the steel industry's scrap position is intensified as the critical winter period approaches. Prompt allocation of material to distress points as they develop has prevented any serious curtailments in furnace operations to date. Foundries are in a somewhat better inventory position, but still taking all tonnages made available.

Cincinnati—Mills' scrap inventories are unimproved, although allocations relieved the recent desperate situation. Collection campaigns are freeing some material, but not in volume to build up stocks appreciably against winter requirements. Foundries are getting adequate shipments; poorer grades of cast are rather easy.

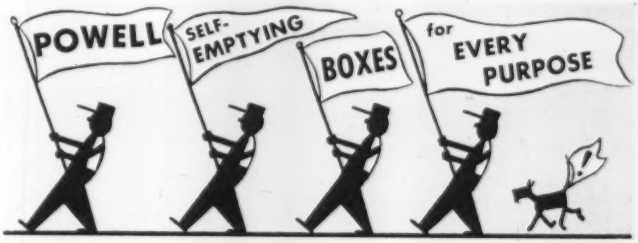
Chicago—Scrap supply prospects for the winter months are bleak with steel ingot operations booming along at near-record rate, 105 per cent of capacity. The steel mills are barely able to keep pace with current demands for scrap, let alone add to inventories. The government-sponsored drive for material has not materially added to stocks, but the drive only now is getting under full steam so that hope persists substantial tonnage will come out before severe weather makes collection and preparation difficult. Complaints are heard of upgrading, though mill rejections do not reflect this to any considerable extent. Cast scrap is in easier supply than the steelmaking grades, largely due to the fact foundries are not as busy as they were three or four months ago.

Boston—Movement of steel scrap is increasing, but neither consumers nor yards are able to build up an appreciable inventory. Scattered allocations are against dealer tonnage. Railroads have combed sources of supply and little remains in prospect other than current production. The recent water rate ruling affects prices at Providence, R. I., and one or two other southern New England ports. The water rate at Providence, formerly $37.25, is now $34.17, f.o.b. rail rate basis. Cast iron scrap moves slowly, since foundries have larger inventories and some of them could handle more work.

New York—Demand for steel scrap is fairly overwhelming with supply far short of requirements. While inventories of most mills have not hit the low of some weeks ago, they are nevertheless lower than they were recently. Consumers are becoming increasingly less selective.

Philadelphia—There have been some new allocations of steel scrap to district mills, but not on the scale of several weeks ago. Meanwhile some foundry steel grades are moving under allocation to mills in the middle west. Cast grades are in little tighter supply, but still not too hard to get.

San Francisco—Local steel producers are leaving "no stone unturned" in their efforts to uncover scrap supplies, importing whatever tonnages



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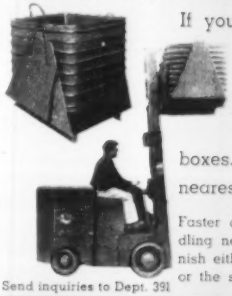

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they can from the Hawaiian Islands and other points, but still consumption is running above receipts.

Los Angeles—Illustrating how successful a scrap drive can be, Union Pacific Railroad collected 13,200 tons of railroad scrap in August.

Seattle—Continued favorable weather has aided scrap collections, receipts in the last three months having continued in steady volume. However, furnaces are using material as fast as it arrives. With the approach of winter, scrap dealers are apprehensive.

Rails, Cars . . .

Track Material Prices, Page 147

Pittsburgh—Gondola car shortage has slowed steel shipments, forcing some producers to stockpile large tonnages. Shortage is blamed on the southwestern flood effects and is one of the worst in history. About 20 per cent of the nation's rolling stock is gondola-type equipment. Paradoxically, fourth quarter allotment of steel to car builders is 455,750 tons—the equivalent of less than 7000 cars monthly, although the building program still calls for 10,000 cars monthly.

New York—While freight car demand still lags, a spurt is expected in the fourth quarter, as various railroads set up programs for next year. Large eastern roads are expected to be in the market for rails also fairly soon: New York Central for as much as 120,000 to 130,000 tons, plus accessories.

Warehouse . . .

Warehouse Prices, Page 151

Cleveland—Steel warehouses are receiving tonnage pretty much on schedule from the mills but their stocks are unbalanced and consumers find it necessary to do considerable shopping around in filling their needs. Not much change in supply conditions is anticipated before first quarter next year and this hinges on upping of the warehouse take to 100 per cent of tonnage receipts in the base period. However, the National Production Authority has not yet acted on this proposal.

Boston—Anticipated deliveries of steel to most warehouses are behind schedule. Their inventories are low and unbalanced. Alloys and most standard carbon plates, structura's and sheets are on a car-to-car basis. Little steel of any type is going into stock.

Philadelphia — Warehouse inventories continue at low ebb, and there is little improvement in sales, despite somewhat stronger demand as the fall season gets under way.

Pittsburgh—Distributors face the possibility of reduced receipts toward end of fourth quarter and the loss of fourth-quarter tonnage not shipped as of Jan. 1.

Cincinnati—Demand on warehouses is unrelenting. Stocks and shipments are inadequate to meet specifications.

Baltimore—Warehouse inventories are unbalanced and amount to only about 30 per cent of pre-Korean volume. Pressure for steel is seasonally somewhat more active, but sales actually show little change due to the limited supply.

San Francisco—Distributors expect to get less steel in the fourth quarter than they did in any of the three preceding quarters because of the canceling out of "free tonnage" deliveries. Mills will be unable to pass along a "dividend" in the form of shipments over and above quotas.

Seattle—Distributors view fourth quarter conditions pessimistically, believing they will be worse off than currently. Allocations are too meager and small fabricators are being severely hit. Warehouse inventories are estimated at 28 to 30 per cent of normal. Demand continues strong, particularly for large tonnages from contractors who have important commitments, chiefly public works. Structurals, reinforcing, rounds, sheets and plates are scarce, while cold-finished products and alloys are definitely in the critical class.

Metallurgical Coke . . .

Metallurgical Coke Prices, Page 149

Chicago — Coke demand is less pressing due to slackening of operations at some foundries, accompanying curtailment in civilian goods production. Also contributing to easier supply is the drop in demand from rock wool producers, reflecting restrictions on building. Coke yield at some ovens is much greater.

STRUCTURAL SHAPES . . .

STRUCTURAL STEEL PLACED

5500 tons, three bridges, Delaware River Toll Bridge Commission, to Bethlehem Steel Co. The bridges are between Pennsylvania and New Jersey at Milford, Portland and Delaware Water Gap, Pa., respectively.

870 tons, state bridge, Union county, New Jersey, to Phoenix Bridge Co., Phoenixville, Pa.

200 tons, trunnion girders, anchor assemblies, etc., Lookout Point dam, Lowell, Oreg., to Schmitt Steel Co., Portland, Oreg., by U. S. Engineer.

100 tons, Alaska Road Commission bridge, Sitka highway, Alaska, to Pacific Car & Foundry Co., Seattle.

STRUCTURAL STEEL PENDING

46,290 tons, tunnel lining, third tube, Lincoln tunnel, bids postponed by Port Authority of New York until Oct. 1; of total, 43,600 tons are cast iron segments, including 38,370 tons straight ring, 5200 taper ring and 30 tons of special segments; remainder is comprised of steel segments, including 1980 tons of straight ring, 680 tons of taper ring and 30 tons of special segments.

3000 tons, three warehouses, Army, Corps of Engineers, New Cumberland, Pa.; Hughes Foulkrod Co., Philadelphia, low on general contract.

2750 tons, municipal viaduct, Russell street, Baltimore; bids closed.

1400 tons, rebids Eklutna tunnel and power project, Alaska; general bids in to Bureau of Reclamation, Denver.

1350 tons, state bridge work, Union county, New Jersey; bids Oct. 9. Bids also are due on 13,480 linear feet of steel piling.

500 tons, warehouse building, Port Newark, N. J., for Port of New York Authority; bids closed Sept. 19.

503 tons, warehouse, Corps of Engineers, Springfield, Mass.; bids Oct. 2.

500 tons, radiochemistry and other buildings, Hanford, Wash.; bids Oct. 3.

500 tons, including machinery, also 350 tons reinforcing bars and 64,000 linear feet piling, Port Industrial Waterway bridge; bids to Board of Contracts, Tacoma, Wash., Oct. 10.

400 tons, shop structure, Anchorage, Alaska;

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erection bids Sept. 27 to Alaska Railroad, Anchorage, materials government-furnished.

340 tons, railroad overpass on west side of Manhattan, N. Y., between 40th and 41st streets; bids closed Sept. 19 by Port of New York Authority.

195 tons, state bridge, Chester, Pa.; Kingston Contracting Co., McAdoo, Pa., low on general contract.

REINFORCING BARS . . .

REINFORCING BARS PLACED

750 tons, Army barracks, Elmendorf air base, Alaska, to Northwest Steel Rolling Mills Inc., Seattle; L. E. Baldwin Co., Seattle, general contractor.

600 tons, housing project PHA 2-11, Boston Housing Authority, Roxbury district, to United States Steel Supply Co., Boston; Joseph Rugo Inc., Boston, general contractor; Builders Iron Works, Boston, 50 tons, structural steel.

300 tons, substructure Washington state highway Pasco bridge, to Soule Steel Co., Seattle; Paul Jarvis Inc., Seattle, general contractor.

REINFORCING BARS PENDING

5000 tons, Eklutna tunnel and power house, Alaska; bids in to Bureau of Reclamation, Denver.

3625 tons, Corps of Engineers, Tullahoma, Tenn.; bids in.

2400 tons, outside facilities, Ladd air field, Alaska; Peter Kiewit Sons Co., Seattle, low.

495 tons, state bridge, Union county, New Jersey; bids Oct. 9.

PLATES . . .

PLATES PLACED

1000 tons, tanks and other equipment for Aluminum Co. of America's plant, near Wenatchee, Wash., to Chicago Bridge & Iron Co., Seattle.

600 tons, tank installations, Shell Oil Co., Willbridge terminals, Portland, Oreg., to Chicago Bridge & Iron Co., Seattle.

500 tons, storage tanks, Elelson air field base, Alaska; to Chicago Bridge & Iron Co., Seattle; general contract to Morrison-Knudsen Co.

130 tons, two oil tanks, Lehigh Portland Cement Co., Bunell, Fla., to Chicago Bridge & Iron Works, Chicago.

PLATES PENDING

1400 tons, tunnel and power project, Eklutna, Alaska; bids in to Bureau of Reclamation, Denver; award pending.

1000 tons, underground tanks, Fairchild air field, Washington, state; bids to U. S. Engineer, Walla Walla, Wash., Sept. 18. Similar installation at Great Falls, Mont., air base; bids soon.

600 tons, expansion of terminal storage facilities, Shell Oil Co., Seattle; awards in near future.

Unstated, tanks and liquid fuel system, Larson air field, Yakima, Wash.; Industrial Electric Co., Seattle, general award, $323,044.

PIPE . . .

CAST IRON PIPE PENDING

Unstated, 53,500 feet 10 to 4 inch cast iron pipe (also valves and hydrants), King county, district No. 7; bids to Parker, Hill & Ingman, engineers, Seattle, Sept. 27; alternative tenders invited.

STEEL PIPE PLACED

305 tons, fabricated pipe, Queens, New York, to American Locomotive Co., New York.

RAILS, CARS . . .

LOCOMOTIVES PLACED

Missouri-Kansas-Texas, twenty 1200-hp diesel switchers, to Electro-Motive Division, General Motors Corp., La Grange, Ill., and Baldwin-Lima-Hamilton Corp., Eddystone, Pa.

LOCOMOTIVES PENDING

Minneapolis, St. Paul & Sault Ste. Marie, 20 diesel-electric locomotives; purchase authorized.

RAILROAD CARS PLACED

Texas & Pacific, 25 cabooses, to own shops, Marshall, Tex.

Minneapolis, St. Paul & Sault Ste. Marie, 600 freight cars, to own shops, Fond du Lac, Wis.

RAILROAD CARS PENDING

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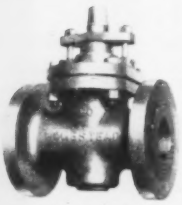
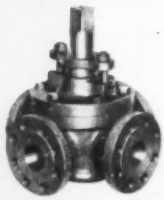


Straight-way—
Flanged or Screw Ends

Three-way—Screw or Flanged Ends



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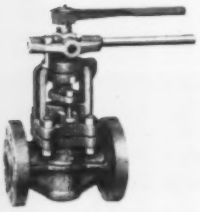
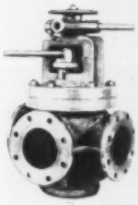
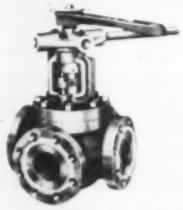


Straight-way—
Flanged or Screw Ends



Three-way—Flanged or Screw Ends



Four-way—Flanged or Screw Ends

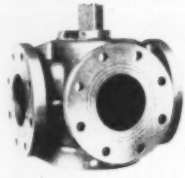
HOMESTEAD LEVER-SEALD, QUARTER-TURN PLUG VALVES
(non-lubricated, or pressure-gun lubricated, as desired)

Made in combinations of metals and alloys to meet practically any service requirement; from 1½" to 10"; from vacuum to 1,500 pounds.

HOMESTEAD-REISER

Straight-way—
Screw or Flanged Ends

Straight-way—
Worm & Gear Operated



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HOMESTEAD-REISER SELF-SEALD LUBRICATED PLUG VALVES
(100%, Port Area, or Venturi, as desired)

Available in semi-steel; cast steel; sizes ½" to 12" for steam pressures to 150 lbs.; oil-water-gas to 200 pounds.

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To help you keep this in mind the next time you need plug valves, we'd like to send you our catalog. Why not write for it today.

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Metalworking Briefs . . .

CONSTRUCTION—ENTERPRISE—ORGANIZATIONAL CHANGES

Weatherhead Gets Order

Weatherhead Co., Cleveland, received an order from Packard Motor Car Co., Detroit, in connection with production of turbojet engines. The J-47 engine, which Packard is to build as a prime contractor with the Air Force under a licensing agreement with General Electric Co., has been designated for the Boeing B-47 Stratojet.

Coaxial Cable Plant Built

A manufacturing plant to produce coaxial cable and molded plastics for American Phenolic Corp., Chicago, has been completed by H. K. Ferguson Co., Cleveland. The new 80,000 square foot plant will be an addition to three American Phenolic plants producing 9000 different items for the electronics and television industries.

Cutting Tool Maker Expands

A plant expansion program, doubling the amount of available floor space for manufacturing special cutting tools, was completed by Modern Corp., Oak Park, Mich. Footings have been poured and steel is being erected for a second plant expansion which will add 10,000 square feet more to the company's facilities. Over $250,000 worth of new machines are being installed.

Bush Buys Sheetmetal Works

Paul A. Bush purchased the Jess C. Hull sheetmetal works at 5 State St., Binghamton, N. Y. The firm name was changed to P. A. Bush & Son.

Fairbanks To Build Foundry

Fairbanks Co., New York, producer of industrial trucks, valves, casters, wheels, etc., will build a new foundry in Binghamton, N. Y. The building will be attached to the firm's present foundry which eventually will become the plant machine shop.

New Graphite Tube Source

A new supply source of impregnated graphite tubes for the chemical industry will be available in October with the opening of a processing plant in Niagara Falls, N. Y., by Graphite Specialties Corp. This newly organized firm is an associate of Falls Industries Inc., Solon, O., maker of impregnated graphite heat-exchangers and associated equipment for chemical processing. Myron Cory, president of Graphite Specialties, was formerly technical director for the Electrode Division, Great Lakes Carbon Corp., New York.

Forms Abrasives Division

With the rapid growth of its line of diamond abrasive materials, Elgin National Watch Co., Elgin, Ill., organized an Abrasive Division, headed by C. R. Myer. John F. Ireland will direct sales and D. H. Prentice will act as technical director. The division also will market a line of accessories normally required in fine finishing operations.

Harrison Radiator to Expand

Harrison Radiator Division, General Motors Corp., Lockport, N. Y., plans a $3,931,000 expansion of its plant. The expanded facilities are sought for work Harrison will do on Air Force turbo-jet engines. The company has applied for a certificate of necessity.

Plans $3 Million Plant

Borg-Warner Corp., Chicago, plans to build a $3 million plant in Wooster, O., for the manufacture of electrically driven hydraulic and fuel pumps for jet engines. Production probably will get under way in April or May, 1952. Robert J. Minshall, president of the company's Pesco Products Division, Bedford, O., and vice president and general manager of the Marvel Schebler Products Division, Decatur, Ill., was named president of the newly-created Wooster Division.

Firm Renamed Rockwell Tools

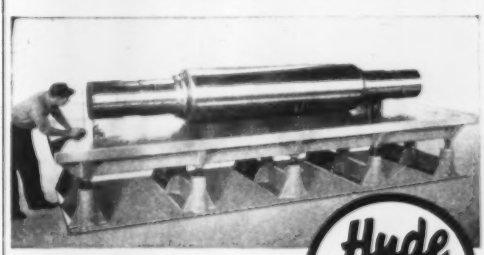
Name of Ohlen-Bishop Mfg. Co., Columbus, O., a subsidiary of Rockwell Mfg. Co., Pittsburgh, was changed to Rockwell Tools Inc. Ohlen-Bishop, purchased by Rockwell in May, is one of the five largest saw manufacturers in the country.

Makes Conductors in Orange

Breeze Corporations Inc., Newark, N. J., acquired a plant at 41 Lincoln Ave., Orange, N. J., for production of electrical conductors. Two plants in Elizabeth, N. J., were purchased for warehousing and stock storage.

National Revamps Set-up

National Motor Bearing Co. Inc. and its subsidiaries have been expanding their manufacturing facilities. Home plant and offices at Redwood City, Calif., have been enlarged; additional building is under way at National Seal Co., a subsidiary at Van Wert, O. Arrowhead Rubber Co., another



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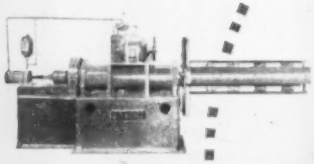
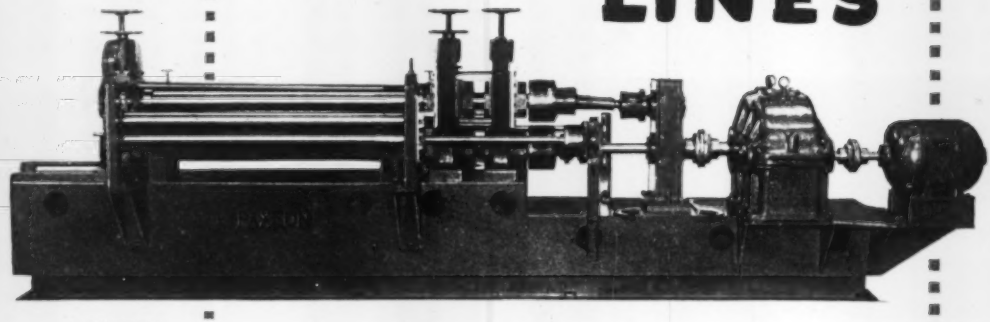


PAY-OFF REELS



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SPECIALIZING IN SLITTING LINES

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subsidiary at Downey, Calif., moved its Air Duct Mfg. Division into a new factory at Long Beach, Calif. The company elected three new vice presidents: Park Q. Wray, in charge of sales; H. Kingsley Pohlman, in charge of manufacturing; Milton C. Bulkeley, vice president and treasurer.

Gas Equipment Plant Grows

Day & Night and Payne Furnace divisions, Affiliated Gas Equipment Inc., added 75,000 square feet of floor space to its Monrovia, Calif., plant.

Chain Belt Moves Office

Chain Belt Co., Milwaukee, moved its district sales offices in that city to larger quarters at 4532 W. Greenfield Ave., directly across the street from the company's West Milwaukee plants.

Hohl Machine Doubles Space

Hohl Machine & Conveyor Co. Inc., Buffalo, is expanding its business in a second plant here at 15 Lawrence Pl. The added facilities will double floor space.

Relocates Detroit Branch

Pratt & Whitney Division, Niles-Bement-Pond Co., West Hartford, Conn., relocated its Detroit office at 8626 W. McNichols Rd. The new quarters provide adequate office space for the sales and service personnel associated with the line of machine tools, cutting tools and gages produced by Pratt & Whitney and its subsidiary, Potter & Johnston Co., Pawtucket, R. I. Samuel J. Matchett is district manager while A. L. Stenglein is district sales manager.

Sylvania Expands Plant

Sylvania Electric Products Inc., New York, will build an addition to its recently completed plant in Warren, Pa. The addition will be used exclusively for carbonizing metals used in radio tubes.

Cleco Appoints Distributors

Cleco Division, Reed Roller Bit Co., Houston, appointed Elect Air Tool Co., Burbank, Calif., and W. E. Mushet Co., San Francisco, as distributors for its products in their areas. Cleco manufactures air tools and accessories.

Bowser Buys Laboratories

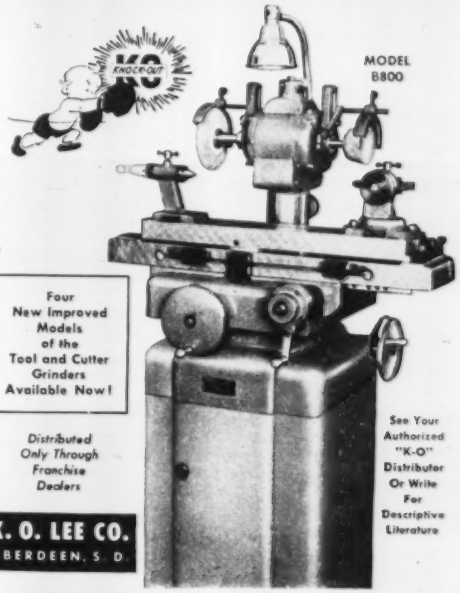
Bowser Inc., Chicago, acquired National Scientific Laboratories Inc., Washington. Dr. Robert I. Sarbacker, who continues as president of the latter company, was appointed director of research for Bowser Inc. Bowser makes products for the petroleum industry, railroads and general industrial use.

Transfers St. Thomas Works

Canadian Allis-Chalmers Ltd., Toronto, purchased the St. Thomas, Ont., Works of Allis-Chalmers Rumely Ltd. The plant was purchased by Allis-Chalmers Rumely from Erie Iron Works in September, 1950. Allis-Chalmers Rumely is primarily a trac-

REFLECTED GLORY: Striking effect of double plate heat and glare absorbing glass and porcelain-faced panels is illustrated by the front elevation of the engineering building at General Motors' technical center. Special truss and exterior wall columns permit full use of building width as interior columns aren't needed

New! **Model B800 Series TOOL and CUTTER GRINDERS**



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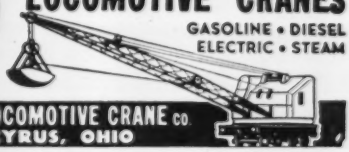

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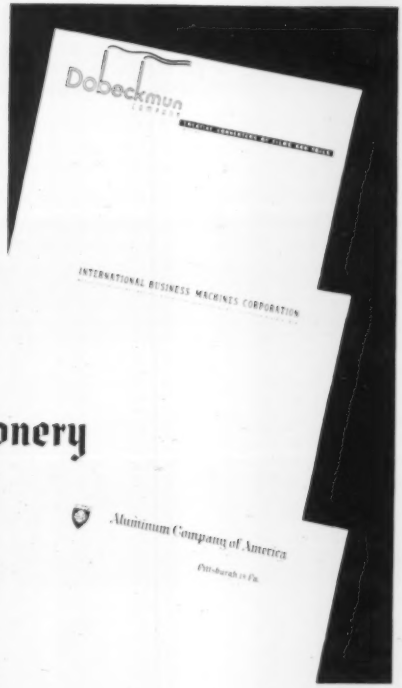

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MODERN METALWORKING MACHINES

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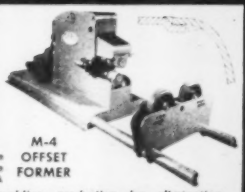
OFFSET FORMING MACHINES

IN TWO MODELS
M-2—1/16 to 3/16 in. plate
M-4—3/16 to 7/16 in. plate
WRITE FOR BULLETIN 73A



M-4 OFFSET FORMER

● Improves automatic welding production by eliminating chill-rings & backing bars ● Forms offset weld-backing joggle from tank shell ● Loosens rust & mill-scale ● Improves shell roundness, which reduces fit-up time.

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JOS. P. CATTIE & BROS., INC.

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GALVANIZED PRODUCTS FURNISHED RE 9-8911 PICKLING & OILING

The *Cleveland Steel Tool Co.*

• PUNCHES • DIES • CHISELS • RIVET SETS •

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IF METALWORKING PLANTS ARE YOUR PROSPECTS . . .

STEEL can put you in touch with the important ones, those that do more than 92% of the industry's business. Tell the buyers and specifiers in these plants of the machines or materials you have for sale through an "Equipment—Materials" advertisement. For rates write STEEL, Penton Building, Cleveland 13, Ohio.

tor and farm implement sales organization for tractor division products. St. Thomas Works manufactures products of the general machinery division and Canadian Allis-Chalmers at Lachine, Que., is engaged in the manufacture of other general machine products.

Builds Heavy-Milling Plant

Magna Mill Products, Los Angeles, completed a $1 million plant for precision heavy-milling of forgings, extrusions, and die castings.

Case Co. Builds in Illinois

J. I. Case Co., Racine, Wis.—industrial tractors, tractor cranes, etc.—will build an assembly plant and an office building in Rock Island, Ill.

Leases Fabricating Shop

Babcock & Wilcox Co., New York, leased a portion of the Maritime Administration's reserve shipyard at Wilmington, N. C., including a fabricating shop and certain machine tools and equipment. Under the lease, a portion of the shipyard will be used for the assembly of boilers, components and associated equipment, and for fabricating metal products used in this type of construction.

Branson Instruments Moves

Branson Instruments Inc. moved its facilities to a new plant at 430 Fairfield Ave., Stamford, Conn. The larger quarters will enable the company to expand production of ultrasonic thickness gages, ultrasonic flaw detectors, and other electro-mechanical devices.

C. H. Besly & Co. Expands

C. H. Besly & Co.—disc grinders, taps and abrasive wheels—Chicago, is erecting a $750,000 factory in South Beloit, Ill.

Aircraft Firm Enlarges

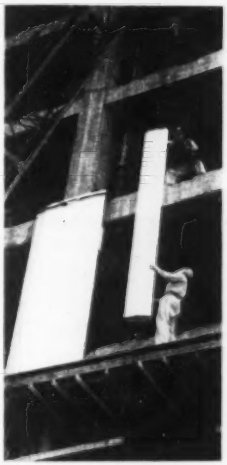
Grand Central Aircraft Co., Glendale, Calif., received a $6 million V-loan for additional facilities for modification of military aircraft. Backlog of the firm totals $50 million.

Industrial Oil Firm Renamed

J. W. Kelley Co., Cleveland, changed its name to Aldridge Industrial Oils Inc. The company produces special lubricants, cutting, grinding and quenching oils, drawing compounds, and heat-treating products.

Gasket Firm Appoints Agents

Flexitallic Gasket Co., Camden, N. J., appointed Fleck Bros. Ltd., Vancouver, B. C., as its distributor to serve the western provinces of Canada. The firm appointed as agents: J. D. Hiles Co. Inc., Pittsburgh; Engineering Products Co., Charleston, W. Va.; Chapman Engineering Sales Co., Cincinnati; De Haven Engineering Co., Indianapolis; Steel & Engineering Products Co., El Paso, Tex.; Energy Control Corp., Philadelphia.



JIG SAW PUZZLE: Prefabricated steel and concrete wall panels are being used for exterior walls in Pittsburgh's Gateway Center office building. An outer shell of stainless steel about 1 32-inch thick is backed by 4½ inches of lightweight reinforced concrete. The panels are bolted and welded together like pieces of a jigsaw puzzle. Extra floor space and lighter interior skeleton are results. United Steel Fabricators, Inc., Wooster, O., formed the stainless shells

Gets Two-Way Radio System

A two-way radio system, believed the first in the country to be used exclusively for plant protection, is being installed at the Schenectady, N. Y., Works of General Electric Co., that city. The network will include 35 base stations in guard posts throughout the 600-acre Works and seven mobile stations installed in plant police cars, fire trucks and ambulances.

Now It's Columbia-Southern

Corporate name of Southern Alkali Corp., Corpus Christi, Tex., was changed to Columbia-Southern Chemical Corp. A wholly-owned subsidiary of Pittsburgh Plate Glass Co., Pittsburgh, the firm is a producer of soda ash, chlorine, caustic soda and related chemicals. Plants are located at Barberton, O.; Natrium, W. Va.; Lake Charles, La.; Bartlett, Calif.; and Corpus Christi.

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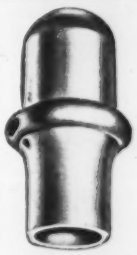

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Aurora 24" Upright Drill, #4MT, tapping.
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Cincinnati Bickford 3'9" Radial Drill.
Brown & Sharpe #5 Plain Grinder, late.
Sellers 4T Tool Grinder, motor drive.
Sellers 6T Tool Grinder, late type.
Landis #2 Universal Grinder, cone drive.
Cincinnati 16 X 36 Plain Hydraulic Grinder, arranged for plunge cut grinding.
Landis 20" x 144" External Grinder, complete tooling, motor drive.
Landis 16 x 72 Plain Cylindrical Grinder.
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Norton 10 x 24 Plain Grinder.
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Heald #70A Internal Grinder.
Heald #78 Centerless Internal & Cylindrical Grinder, late type, complete.
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Niles Bement Pond 84 x 72 x 14' Double Housing, Reversible DC motor drive, box table, 4 heads, electric rail clamp.

Cincinnati 24 x 24 x 6' Double Housing.
Cleveland 26 x 26 x 8' Openside Planer.
Gray 36 x 36 x 12' Double Housing Planer.
Universal 24" Openside Shaper Planer.
Lodge & Shipley 16" x 6', single pulley drive 12 spindle speeds.
American 16" x 8', 3 SCD, 56" center distance, 1¼" hole in spindle.
Bradford 18" x 8', 3 SCD, 40" centers.
Hendey Model B-3 Special Application Lathe for Turning, 20" swing, 2½" hole in spindle, 54" centers.
Monarch 20" x 6', motor drive, 8 speed, 1⅝" hole in spindle.
Lodge & Shipley 20 x 8, single pulley drive 12 spindle speeds.
Bradford 20" x 18', 4 SCD, 12' center distance. Loose chatge.
American 24 x 10', Vee belt motor drive, 8 speed head.
Niles 30 x 10' centers Timesaver.
American 30" x 26' centers, 12 speed head, 2 9/16" hole in spindle.
American 36" x 33' center distance, 2¾" hole in spindle, first class.
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Ingersoll 42 x 36 x 12' Miller, 4 heads adjustable rail.
Hall Planetary Style D Miller.
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58 tons—1" Rd.—OH—Cold Rolled—FS1137 or FS1335 or C-1041.

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21/32"	Rd. 10/12'	51100	14250 #
1-13/16"	Rd. 10/12'	52100	6500
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27/32"	Rd. 10/12'	52100	700
HOT ROLLED BARS			
1-3/16"	Rd. 10/12'	52100	7000 #
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3¼"	Rd. 10/12'	4320	1500
5"	Rd. 10/12'	4320	1100
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5/16" Rd.	H.R.	14' Len.	25000 #
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OIL STORAGE TANKS
Capacity 20,000 gallons and other sizes. Mounted or Dismounted.
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CENTERLESS GRINDERS
#2, #3, #4 Cincinnati or Landis
#72, #81 Heald
Late Models, in excellent condition.
Write Box 373,
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WANTED
One 500 to 1000 HP
DOUBLE REDUCTION GEAR UNIT

Approximately 12 to 1 ratio. Input speed 360 RPM full load. Write Box 367, STEEL, Penton Bldg., Cleveland 13, O.

PRESSES—IMMEDIATE DELIVERY

1800 Ton R.D. Wood Hydr. #H-226 22" opng. 3000 # p.s.i. 7' 6" x 18' platens; 2—58" x 13' x 2½" extra drilled platens. Together with 300 KW Girdler Hi Frequency 113 tons. Single opng; 54" x 22" platens; also extra drilled platens; Together with 16 KW Girdler H.F. 5 opening Becker Von Huellen Hot Plate Plywood Press.

ALL IN WORKING CONDITION.

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Dempster Bros. Model 125 Hydraulic SCRAP METAL BALING PRESS. Good as new—can be seen in use. Includes switches, wiring and connections.

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1—34" United Roll Lathe, enclosed headstock
1—156" x ¼" sheet squaring shear

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3/16" x 10' Ohl Plate & Sheet Shear. Complete with all accessories including motor and switch box. Shear rebuilt July, 1951. All movable and working parts replaced new by Thomas Machine Company.

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BORING MILLS, 24"-36"-42"-52"-66"-72".
HAMMER, NAZEL, 5-N, 6" x 6", M.D.
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Covering City of Cleveland and Northern Ohio Area by established Chicago Steel Warehouse specializing in Spring Steels, Steel Tubing, Cold Finished Bars, Strip and Sheet Steel, etc. All replies will be held in confidence. Write Box 369, STEEL, Penton Bldg., Cleveland 13, O.

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Various Company Benefits.

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Experienced and aggressive superintendent required for blast furnace construction. Must have ability to handle 200 men. Prefer graduate engineer. Submit resume to

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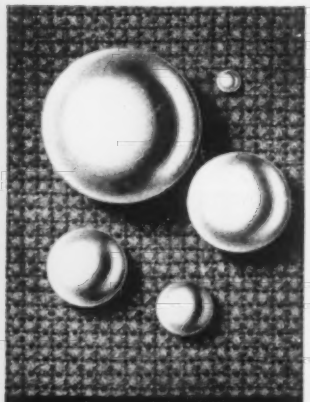

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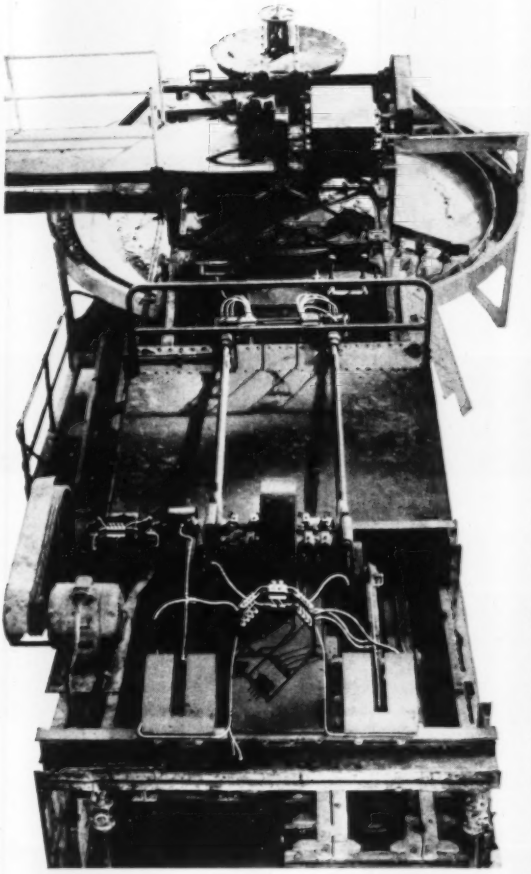


Farval installation on a Dorr Boul Classifier at the Venterspost Gold Mining Co., Ltd., Witwatersraud, Transvaal. Note the unusual method of mounting the 4 groups of valve blocks on special frames above the machinery.

IN SOUTH AFRICA

Farval speeds gold production, saving lubricants, labor and bearing expense

● Pressed for more production, equipment at South African gold mines is operated around the clock. Any shutdown, as for lubrication or bearing repair, interferes seriously with gold output.

This need for uninterrupted operation led to a trial installation of Farval Centralized Lubrication by one company on a Dorr Classifier. Benefits were obvious immediately:

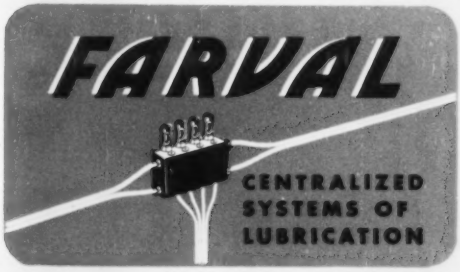
1. It is no longer necessary to shut down equipment to lubricate it.
2. Certain difficulties in gold extraction, formerly caused by presence of surplus grease are eliminated.
3. Dust containing cyanide is kept out of the bearings, thus reducing wear and saving repairs.
4. Lubricating labor is saved.
5. Waste is eliminated, with a consequent saving in grease of approximately 80%. This saving alone pays for the installation of Farval.

Results have been so amazing that, one after another, gold mining companies have tried out Farval Centralized Lubrication and then installed systems widely throughout their plants.

Farval is the original Dualine system of centralized lubrication, proved practical in 20 years of service. The Farval valve has only two moving parts—is simple, sure and foolproof, without springs, ball-checks or pinhole ports to cause trouble. Through its full hydraulic operation, Farval unfailingly delivers grease or oil to each bearing—as much as you want, exactly measured—as often as desired. Indicators at every bearing show that each valve has functioned.

Write for Bulletin 25 for full details. The Farval Corporation, 3270 East 80th Street, Cleveland 4, O.

Affiliate of The Cleveland Worm & Gear Company, Industrial Worm Gearing. In Canada: Peacock Brothers Limited.



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Malleable Castings

Trade Mark

The vast multiplication of tools for use by man, creates the need for infinite duplication of malleable parts

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